



Monitoring Times

A Publication of
Grove Enterprises, Inc.



Swaziland

Broadcasting's Outlet
to Southern Africa

■ Vacation in the Smokies
Bring the Kids and Pack the Scanner!

■ The Mysterious Comsat Case

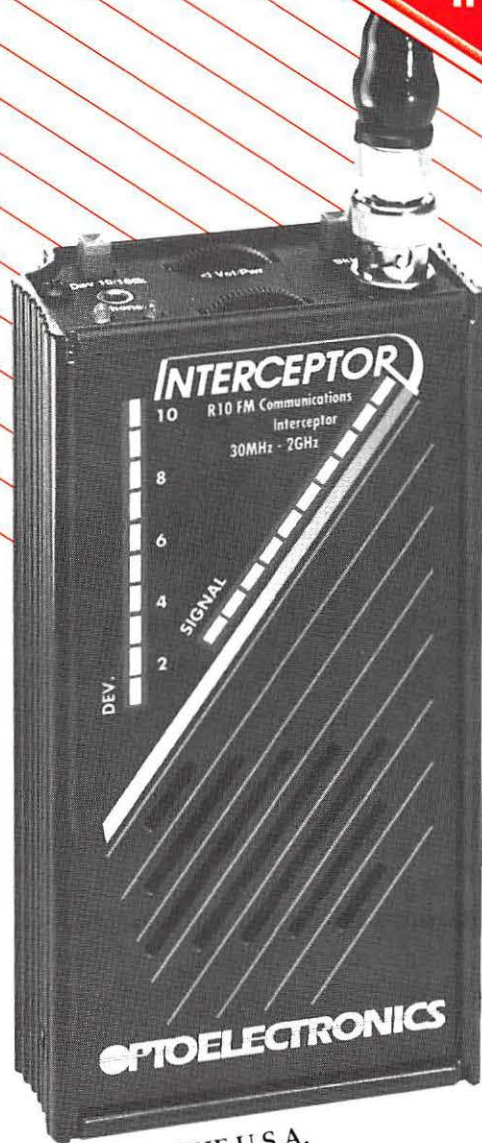
■ Voices from Bosnia-Herzegovina

■ Low Power Broadcasting
at the Drive-In Movies



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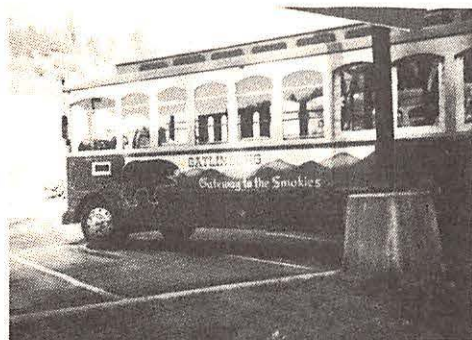
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Monitoring Times



Scanning in the Smokies

By Gary Inman

8

The northern gateway to the most visited National Park in the United States is historic Sevier County, Tennessee. If you are among the throngs who come to this family vacation spot, don't forget to bring your scanner! When you add the federal frequencies for the Park to the many local agencies, you can scan happily for hours!

Tuning in to Swaziland

By Colin Miller

12

This tiny, land-locked country, tucked into South Africa's Transvaal province, had no broadcasting station at all until 1965. In the 70s, its location caught the attention of two American organizations as being ideal for broadcasting into South Africa, Mozambique, and beyond. Broadcasting in 20 languages, Trans World Radio's Swaziland site can occasionally be heard even in North America.

Voices from Bosnia-Herzegovina 16

By Larry and Gayle Van Horn

In this timely article, the Van Horns have compiled broadcast and utility frequencies which can give a glimpse into this war-torn section of the world. It is clear that, regardless of the ultimate settlement, members of the United Nations will be involved in keeping or making the peace for the foreseeable future. Here is a list of the players and some of the voices you may hear.



Canadian Forces stationed in Germany

Cover Photo: Trans World Radio's transmitter building in Swaziland houses two 100 kW and three 25 kW shortwave transmitters, plus one 50 kW AM station; courtesy TWR.

The Case of the Vanishing Satellite 21

By Theo Pappan

There is a little-known and unofficial brotherhood within the hobby... Most of them have never met. Simply by tracking and logging details about communications satellites, their network can discover a phenomenal amount of information. Why do they do it? Theo Pappan successfully draws us into the mystique that surrounds his particular passion.

Broadcasting at the Drive-In Movies 25

By Ernie Blair

When the city of Huntsville, Alabama, needed a better broadcasting system for their summer movies at the drive-in, Ernie Blair took it on as a personal challenge...with a successful conclusion.

And More ...

Satellites play an increasingly important role in modern life. In addition to this month's feature on sleuthing out communications satellites, "On the Ham Bands" looks into tracking amateur radio satellites.

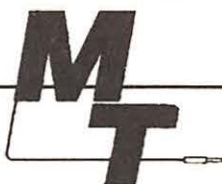
If it's another mystery you want, try 1600-1800 kHz; "Utility World" trains its focus on some unusual CW callsigns. If you catch one of these, it's quite possible you're listening to a fishing net!

Reviews this month focus on two radios which are designed for simplicity: the Sony SW33 portable shortwave receiver ("Magne Tests..."), and the AOR AR33B handheld VHF receiver ("Scanning Equipment"). These receivers don't do it all, but what they do, they do well.

You'll find articles and tips on transmission lines, choosing a volt-ohm meter, expanding the memory in your PRO-2004/5/6, and much more in this edition of *Monitoring Times*, so don't waste time. Let's get to it!

DEPARTMENTS

Letters	3	Shortwave Guide	60
Communications	6	Propagation Charts	88
Shortwave Broadcasting	28	What's New	90
Utility World	32	Scanner Equipment	94
The Scanning Report	36	Magne Tests	96
The Beginner's Corner	40	Computers & Radio	98
Federal File	42	Demaw's Workbench	100
Plane Talk	44	Experimenter's Workshop	102
Below 500 kHz	46	Antenna Topics	104
American Bandscan	48	Ask Bob	106
Satellite TV	50	Club Circuit	108
On the Ham Bands	52	Special Events Calendar	109
Outer Limits	54	Stock Exchange	110
Program Spotlight	56	Closing Comments	110
QSL Corner	58		



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LETTERS

The breezes are balmy, the kids are out of school and it's time to think about a family vacation! Bob Kay has some tricks for you in "Scanning Report" on how to take your radio toys with you in a compact package so you can benefit from a new venue from which to monitor.

I have just one word of caution to add, however; whatever nifty packaged monitoring post makes your hobby more portable also makes it more vulnerable to theft. "Federal File" columnist Steve Douglass learned this to his dismay when his beloved PRO-2004, which he had neatly rigged into a small suitcase, was stolen from under his hotel bed. Steve promises he'll write up an account detailing the rest of his "vacation from hell," because the misadventures didn't stop there!

This month sees a changing of the guard in the "Shortwave Frequency Guide." Greg Jordan, who has been associated with the Guide since 1984—even before it became a permanent part of *Monitoring Times*—is stepping down as Frequency Manager for a well-earned respite. Greg has been a vital member of the staff and has patiently seen the frequency section through a great many changes. His part in helping *MT* become computer-literate is especially appreciated.

Assuming the job of frequency entry and coordination is Gayle Van Horn, who already receives a great deal of relevant input from your loggings and QSL reports. We always appreciate your contributions to the English language section, and we hope to be more consistent in acknowledging your part in keeping *MT*'s Shortwave Guide the most comprehensive and up-to-date in the hobby.

This month also sees the introduction of a new quarterly department: "Program Spot-

light." This column will not have a permanent editor. Instead, persons who have an interest in a particular type of programming will be invited to let us in on where and when to tune. This month, for example, Ron Tamburello chose a challenging topic — programs by and for women. Other topics being planned include programs on music, on travel and tourism, and programs on books. Do you have an area of expertise, or a topic you'd like to see? I'd be happy to hear your suggestion or proposal.

As announced last month, Bob Evans' new column on data modes will fill the July slot. Then in August, "Radio Reflections," which has been a column without a home, will become a quarterly regular. That column will also be authored by various writers, and will focus on radio's past. There have been several requests for articles on maintenance and modifications of tube-type receivers, for example. We hope this column will help satisfy that need as well as reminisce about stations, programs and experiences from yesteryear.

RCI Replies



More information on Radio Canada International's shortwave feeds was forthcoming from Director of Engineering Jacques Bouliane in

response to reader comments in April's "Letters."

Says Jacques, "All of our programs that are radiated from our transmitting studios in Sackville, N.B., are sent by satellite from our Montreal studios. This is also true for the programs of other broadcasters whose programs are relayed by Sackville (BBC, Deutsche

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Monitoring Post Pin Up



Doug Graham of St. Mary's, GA, is shown in a radio room of the *USS Tennessee*. Inset photo shows his barracks room setup which includes a Sony 2010, PRO-2006 and PRO-43.

Welle, Radio Japan, Radio Austria, Radio Korea, China Radio International, and Radio Monte Carlo (Moyen-Orient).

"We recently switched to a digital SCPC [Single Channel Per Carrier] feed system on the Ku band on Anik E-2. Our footprint covers the southern half of Canada and the northern half of the United States. Reception is possible within this footprint with a 2.4m dish and the proper receiver.

"It is true that C-Span 'eavesdrops' on this 'private' feed system, with the consent of RCI/CBC, and the other broadcasters we carry. If my information is correct, however, the BBC comes to C-Span on a separate circuit.

"One reader made a comment on the audio quality of some of the programs [relayed by C-Span]. For RCI, the audio should be received with a sound quality close to studio quality; our programs are uplinked almost right off our studios. All of the other broadcasters carried on our circuits to Sackville must cross one ocean. Some do it with a high quality digital circuit, others do it on a 3 kHz analog circuit. In this case, the sound quality would be closer to that of an AM radio station.

"It might be of interest to your readers to know that we feed some University/College and Community Radio Stations this way, with our programs in French or English, or with programs in one of our other five languages. Some stations also pick up programs from foreign broadcasters.

"I trust that the above information will be of interest; thank you for this opportunity."

And we thank you, Jacques; it should be gratifying to our readers to know that their comments are duly read and noted by broadcasters worldwide. A complimentary copy of *Monitoring Times* is sent to nearly every broadcaster listed in our Shortwave Guide, and every once in a while a letter such as this one lets us know it's not for naught!

Short Shorts

"Is the cover picture and article about Radio Rebelde for real? Does Don Moore live in Havana? Why would you write about a radio station used to fool the people of Cuba and the world? This story is more than 30 years old! I challenge you to print a story about freedom radio today and what it's done recently for real freedom for people. Voice of America, Radio Free Europe, Radio Marti, BBC, etc. in regards to Eastern Europe, Russia..."

Bill Stone, Oklahoma City, OK
[A feature article of the type suggested would be most welcome ... anyone want to take it on?...ed]

Right Technique; Wrong Diode

Several readers caught an inadvertent mistake in the May "Experimenter's Workshop" column. In the PRO-43 modification number 1, the instructions are to remove Diode D-5, and to save it for modification number 2.

The text should have read Diode D-4—there is no D-5 diode. Thanks to those who notified us of the error.

"I have to say 'Hats off' to Don Moore on his story on Rebel Radio. This is the most interesting story I've ever read in a communications magazine. I never realized what Castro went through. Keep these types of stories coming."

James Tobola, West, Texas

One reader supplied this updated information to Chuck Robertson concerning the Mutual UFO Network given in a sidebar to Chuck's April feature. "The MUFON Amateur Radio Net on Saturday nights is found on 3978 starting around 8 pm EST. They usually sign off around 11pm when the VOA signs on. If they continue after that they move up to around 3986. Guess they gave up on 3929 due to interference. There still is much intentional QRM.

"There is supposed to be another net called the Intergalactic Informational Exchange Net on 1998 starting around 8 pm on Thursday nights, though I haven't been able to monitor them yet.

"By accident I also ran across a UFO show on TVRO at F3/23 on the Cable Radio Network. It was run on 7.23 mono, narrowband on Sunday night around 11pm or midnight."

Rex Whetzel, Wolcottville, IN

"Re: Caller ID, p.38, Feb. MT. Are you aware all federal offices and elected officials apparently now have caller ID? I never remember this being announced to the public. Creeping 'Big-Brotherism'?

"In Pennsylvania caller ID has been approved by the state public utility commission by the decision was appealed to court by the ACLU.

"The court ruled caller ID is in conflict with the state anti-wiretapping law. The case is now on appeal to a higher court."

Anonymous contribution
[See this month's Scanning Report for more discussion of Caller ID...ed]


"I have found a hit-or-miss way to unscramble D.E.S. I live not far from the Sheriff's Department. When an officer goes in the building to do paperwork he turns on his mobile extender which I can receive slightly scratchy. If a scrambled message goes out on the main channel it is unscrambled on the (handpack) mobile extender frequency.

"Nine times out of ten it was either running a registration or license plate, or someone talking about a Superbowl score. One time they gave the name of someone they were serving a warrant on. If you haven't tried this in your area and they have D.E.S. it might be worth a try."

David Hanna

Country Code Chart

Here's a hint from reader Garrett Stevens of Muscle Shoals, Alabama. "A lot of people like to keep up with the different countries they have logged, as do I. I have enclosed a copy of an International Country Code chart I use to help me see at a glance which countries I still need, by highlighting the ones that I have logged. These can be obtained from your local Digi Postal dealer, usually for free, or call 1-800-877-3444."



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001	Afghanistan
002	Albania
003	Algeria
202	American Samoa
004	Andorra
005	Angola
239	Anguilla (Formerly Leeward Islands)
196	Antigua (Includes Redonda)
006	Argentina
252	Armenia (Formerly USSR)
243	Aruba
007	Ascension
008	Australia
009	Austria
253	Azerbaijan (Formerly USSR)
010	Azores
011	Bahamas
012	Bahrain
013	Bangladesh
014	Barbados
246	Barbuda
015	Belgium
016	Belize
017	Benin
018	Bermuda

The End Effect

"Being an SWL antenna freak (I'll try anything), imagine my joy at finding your April edition containing no less than six antenna articles," writes Fred Spritz of Laguna Hills, California.

"My only complaint is the inconsistencies between a full wave loop on page 16 that 'must not be corrected for end effect' and another full wave loop on page 104." Fred noticed the formulas for calculating the length appeared to differ, and wondered "is it due to the TV 6mc bandwidth or the wire vs. copper tubing construction?"

I turned this question over to Bob Grove for his interpretation. Here is his answer: "End effect

Continued on p. 111



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SCHEDULE

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12:00 to 5:00 pm

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7:00 to 9:15 pm

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8:00 to 11:30 am

Registration Open

9:00 am to 12:30 pm

Exhibits Open and

Morning Seminars

12:30 to 3:00 pm

Exhibits Open/Lunch Break

Saturday cont'd

3:00 pm

Exhibits Close

3:00 to 5:15 pm

Afternoon Seminars

7:00 to 9:00 pm

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Transmitter Bug Hunt

Sunday, October 17

9:00 am to 12:30 pm

Morning Seminars

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Friday evening starts the weekend off with a two hour "Hobby Talk." Moderator Bob Grove will host this open forum of attendees, speakers, international broadcasters and specialists in the radio hobby field.

Topics will include the new scanner laws, the future of shortwave broadcasting, new technology and much more. The balance of the weekend seminars will include these new topics for 1993:

An Introduction to Computers
Monitoring SW Military/HF and USB
ELF—Are We Being Fried?
Choosing a Scanner/SW Radio
Monitor the Feds!
Beginner's Introduction to Electronics
The Intermediate Listener:
• Scanning—When to Accessorize
• Shortwave—How to improve reception
• Filters—When and How?
LOWFERS—Earthquake Monitoring
Monitoring Military/VHF/UHF
Advanced Antennas—Design and Theory

Shortwave Broadcasting: The Future
A Beginner's Guide to TVRO
Communication Satellites
An Introduction to Digital Communications
Surveillance Techniques
The Strange and Unusual:
• Monitoring numbers stations, digital signals, etc.
Advanced Digital Communications
• How to decipher the "weird ones"
• Troubleshooting
Meet the International Broadcasters
Pirate Radio Monitoring
Public Safety Monitoring

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Catch the Clandestines
Beginners:
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• Get Started in Scanning
• Utility Monitoring
• Q&A for Beginners
• Get Your Ham License

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Austin Antenna
Bay Area Scanner Enthusiasts
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Mail Order Mushrooms

A man listening to his scanner in San Antonio, Texas, happened to stumble across the cordless phone bands when a conversation made him sit up and take notice. A woman, who the scanner listener did not recognize, was asking a man if he could get her some cocaine. The man replied in the affirmative and the woman gave him directions to her home.

Meanwhile, the scanner listener had called police and tipped them off to the location of the drug deal. Sheriff's officers hastily arranged for a quick stake-out and arrested a man as he approached the woman's door. They also arrested a second man who was waiting in the car.

Police did not find any cocaine; however, a search of the suspects did turn up a bag of what police believe were hallucinogenic psilocybin mushrooms. A bottle of marijuana was also found in the car.

Police had no comment on the concerned citizen with a scanner who was critical in taking the drugs off the street.

FCC Doing Its Part to Reduce Federal Deficit

Austin, Texas-based Conquest Airlines has received a \$8,000 fine from the U.S. Federal Communications Commission. According to the FCC, Conquest operated a radio transmitter in Corpus Christi without a license. The frequency was used for communications between pilots and ground crew.

John Walters, president of Conquest Airlines, called the lack of a license "an oversight on our part. [We didn't get] the proper papers signed. It's a minor technical thing." Walters

said that he did not expect Conquest to have to pay the fine.

FCC public affairs specialist Rolando Gallegos agreed that the FCC does sometimes consider reducing fines in some situations but said that he doubted Conquest would get off the hook. "They were really caught red handed," said Gallegos.

University Hit With FCC Fine

The University of Massachusetts at Lowell has been hit with a \$16,000 fine. According to the Commission, the University interfered with the Coast Guard's 5696 kHz frequency.

Coast Guard spokeswoman Phyllis Kay said that the frequency was used to communicate with aircraft searching for vessels missing at sea. The UM transmissions reportedly came from what school officials called "atmospheric research equipment."

Bodo W. Reinisch, director of the Center for Atmospheric Research denied that the University violated federal law knowingly. The FCC, however, called the interference "willful and repeated," citing five incidents between November of 1992 and January of this year.

Paying the \$16,000 fine would "devastate" the Center for Atmospheric Research, said UM's Reinisch. "We'd have to stop the operation and lay off staff."

FCC Employee Honored

J. Jerry Freeman, Engineer in Charge of the FCC Field Operations Bureau in Norfolk, Virginia, is a recipient of the Eugene C. Bowler Award. This award is conferred for career excellence in the telecommunications field by a government employee. Freeman and his office have been very helpful to both *Monitoring Times*

and Grove Enterprises, and we wish to congratulate him on receiving the honor.

America's Most Gullible

A hoax perpetrated by a radio station in San Diego, California, had traffic tied up for hours around a small airport as hundreds turned out for what they thought would be a once-in-a-lifetime experience.

KGB-FMDJ Dave Richards told listeners that the space shuttle *Discovery* was being diverted from Edwards Air Force Base to Montgomery Field — a tiny airport with a short 2,400 foot runway located in the middle of a crowded residential neighborhood.

By 8:30 am, over a thousand people had turned up, many with kids in tow and video cameras in hand. Airport manager Tom Raines was reportedly "furious," but not as mad as local police who had to dispatch dozens of motorcycle officers to the scene.

Police spokesman Bill Robinson said that the station is being billed for "our manpower hours," and "should it refuse to pay, [City Attorney] John Witt might have an answer for them."

Says DJ Richards, "I was just looking for a good scambo... I just light these bombs and then I run away."

Goodbye Virginia CB

State police in Virginia have given up on CB radio. The "good buddy" radios will no longer be installed in the state's newest 325 cruisers.

Police defend the move saying that CB radios have fallen victim to newer technology that requires a thicket of antennas, including hi-tech stolen auto tracking systems. "We're



Transmitter Melt-Down: Marty King of White Bluff, Tennessee, took these dramatic pictures of WWCR/WNQM after the fire of April 4th. Although the equipment was totally destroyed, the antennas, seen in the background, remain intact.

COMMUNICATIONS

having a space problem," says Virginia State Police spokesman Charles Vaughn.

The American Automobile Association predicts dire consequences, saying that with the loss of CB, "it's going to be motorists' roulette out there [on the highways]."

Some police agree. One unidentified trooper complained that "They're destroying a vital link the public has with the state police."

No More TV Blues

Just in time to fill in the entertainment gap caused by those boring summer reruns on TV comes news of a new satellite TV service. Starting this month, Saddam Hussein has launched Iraq International Television (IIT).

Also coming your way from Iraq this month is "The Voice of Youth Radio from Dar al-Salam." Programs will reportedly include a wide range of entertainment such as songs about Saddam, plays about Saddam and summaries about the latest news of Saddam.

Curiously, Dar al-Salam is the ancient name given to Baghdad by its founder, Caliph al-Mansur. It means, "House of Peace."

Soccer Saves Money

It's a rare event for any organization, but especially one with its roots in the government. The Swiss Broadcasting Corporation — parent organization to shortwave's Swiss Radio International — has announced that it ended last year with a budget surplus of some 34,000,000 francs.

An economic miracle? A fancy accounting trick? No, the budget surplus was caused by soccer. The money had been set aside for sports coverage that didn't happen because Switzerland's team failed to qualify for the European Soccer Championships.

The SBC now says that it has a cool 115,000,000 francs in the bank.

Good Morning, Motorists!

Officials in Fairfield, Connecticut, are still trying to find out how it was done: someone apparently broke into the radio system controlling a 10-foot-high electronic traffic sign overlooking Interstate 95. Instead of the usual construction messages, motorists travelling southbound on the Maine-to-Florida route were greeted with the words, "You All Suck."

State troopers were unable to disassemble the sign which continued to display its message until a state crew was able to throw a tarp over it.

Said Department of Transportation spokesman William Keish, "We're taking steps...to upgrade our security."

Radio Freebie! Radio Freebie!

He's 52 years old but doesn't look a day over 18. He's Archie, the comic strip teenager and despite his five decades in the public eye, he's neither grown up nor lost his ability to capture the attention of kids.

For this reason, The American Radio Relay League, in conjunction with Archie Comic Publications, is once again offering copies of their joint venture, "Archie's Ham Radio Adventure."

A full-color comic book, it features Archie, Betty, Jughead, Veronica, Reggie, Dilton and Moose as they use ham radio to relay messages out of a volcano-ravaged Central American nation, foil a jewel thief and coordinate a complicated rescue from treacherous flood waters.

If all of this sounds exciting, here's more good news. You can get a copy of "Archie's Ham Radio Adventure" — in fact you can get up to 100 copies — free of charge just by calling the American Radio Relay League. Their phone number is 203-666-1541. Ask for Stacey. Tell him Jughead said to call.

Bad Radio Law Temporarily on Ice

According to reader Ron Schmidt, a bill removing the exemption allowing Minnesota's hams to have "radios capable of receiving police frequencies in their vehicles" has been pulled by its author, Mike Delmont.

According to Schmidt, "one of the co-authors who did return my call said that he could do this 'another way' by introducing it as a quick amendment to some last minute monster appropriations bill." Keep your eyes open, Minnesota radio listeners. They're slippery critters out there.

By the way, any radio hobbyists — whether you live in Minnesota or not — can talk to Mr. Delmont by picking up the phone and dialing 612-296-4226. His address is #307 State Office Building, St. Paul, Minnesota 55155.

"Communications" is written by Larry Miller from a variety of sources including material submitted by the following readers and other VIPs: Rachel Baughn, Brasstown, North Carolina; Al Burzynski, San Antonio, Texas; Jeff McDonald, Derry, New Hampshire; B.J. Hirsch, Monticello, Georgia; Steve Marshall, USA Today; Norm Mettuer, Billerica, Massachusetts; Thomas Risher, Whittier, California; Thomas White, Driftwood, Texas; plus the BBC Monitoring Service, National Scanning Report and the W5YI Report.

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Scanning in the Smokies

By Gary Inman, WB4PUK



Get your kicks on Route 66 — sounds like a vintage TV show, but it could be the start of a scannbuff's perfect vacation.

Take the Highway 66 exit off Interstate 40 in East Tennessee and you will find yourself in historic Sevier County. At first glance it looks like most East Tennessee counties with wooded hills and farms, but as you drive further south a difference becomes quickly apparent.

Sevier County is located adjacent to the Great Smoky Mountains National Park, the most visited national park in the United States. Approximately nine million visitors a year make their way to the Smoky Mountains and many of them travel via the Sevier County route.

Three municipalities are situated in Sevier County and lie between the Interstate and the Park: Sevierville, Pigeon Forge, and Gatlinburg, which

borders the National Park. Over the years this area has become a major vacation destination, with thousands of shops, restaurants, motels, malls, amusement centers, and other attractions. The variety of things to see and do ranges from bungee jumping, to the world's largest knife shop, discount malls to country music shows — in other words, there is something for everybody and enough scanner action to keep any monitoring fan engrossed for hours.

Law Enforcement

Local law enforcement in this vacation paradise is provided by four agencies: the Sevierville Police Department, Pigeon Forge Police Department, Gatlinburg Police Department, and the Sevier County Sheriff's Office. The Sheriff's Office also

operates the E-911 dispatch center for the Sevier County area, and relays emergency calls to the proper agency.

Most of the law enforcement communications occurs in the UHF portion of the spectrum. Some digital and frequency inversion scrambling has been noted but most comms are in the clear mode. Despite the large numbers of visitors every year, the crime rate in the area is very low, due largely to the professionalism and efficiency of the local law enforcement agencies.

Fire Departments

The Sevier County area is served by no less than nine fire departments. They range from municipal departments with paid and volunteer members, to small, completely volunteer depart-



Sevier County Fire Department dispatch.



Pigeon Forge Police Department.

ments. A cooperative spirit and dedication to duty is evident among the various departments.

Fire Department communications can be found on both the VHF highband and the UHF portion of the spectrum. The busiest of these departments seem to be Sevierville, Gatlinburg, Pigeon Forge and the Seymour Volunteer Fire Department.



Medical Units

Emergency medical services are provided by the Sevier County Ambulance Service and the Gatlinburg Fire Department. Sevier County operates four ambulances on a twenty four hour basis, utilizing three strategically located stations. Gatlinburg Fire Department operates two ambulances also on a full-time basis. Each unit is staffed with a certified paramedic and an emergency medical technician. All units are equipped to provide Advanced Life Support.

A medium-sized community hospital is located in Sevierville, with larger facilities in nearby Knoxville. A Level I Trauma Center with helicopter transport is also located in Knoxville, and is only minutes from the Sevier area by air.

Most emergency medical communications activities occur in the UHF portion of the spectrum, although some high band frequencies are also used.

The Sevier County Emergency Rescue Squad is an all volunteer agency that performs additional emergency services and assists other departments, and agencies, in the Sevier County area. The Rescue Squad is the primary agency for vehicle extrications, search and rescue, and other types of emergency activities. They often provide emergency medical standby at sporting events, or other functions that attract large crowds, and act as a backup to the Ambulance service for disasters operations. The squad consists of about thirty active members, many of whom are certified as Paramedics or Emergency Medical Technicians.

Local Government

Local government frequencies are also very active during peak periods of tourist activities, and can be very interesting and informative. Pigeon Forge

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and Gatlinburg both operate local shuttle buses for the convenience of the many visitors to the area. The buses are equipped with two-way radios and the drivers use them heavily. This is a good way to keep up with the latest traffic conditions by listening to the chatter!

Federal Agencies

Don't neglect to check the Great Smoky Mountains National Park frequency. It stays very busy during the peak months. Activities range from campground maintenance to law enforcement activities. The Park Service operates a VHF highband repeater on Clingmans Dome (elevation 6642 feet); it can be monitored for many miles around the park. Clingmans Dome also has an observation tower open to the public. It's a great place to take a handie talkie or a portable scanner!

While you are in the area, visit the Cades Cove section of the park. The Park Service has kept this early community exactly as it was in the pioneering days of East Tennessee. An eleven mile loop road meanders by cabins, churches, and the local mill, and can be driven by auto or bicycle. The Sugarlands Visitor Center is a good place to start a Smokies visit; it is located just outside of Gatlinburg at the main Park entrance. According to Park personnel, the Sugarlands Center will host about two million people a year.

Business Bands

An area with such a large number of tourist attractions always means good hunting for a scanner buff. Many of the places that cater to the vacationer utilize radio communications to make life more enjoyable for everyone. Check the VHF and UHF business allocations ... it seems there is always something interesting going on.

One of the largest attractions in the area is the Dollywood Theme Park in Pigeon Forge. Dolly Parton, who was born and raised in Sevier County, owns and operates the park. Dollywood features big name country entertainment, crafts and rides for the kids. Dollywood has several repeater and direct channels in the UHF business band. Don't forget to scan the itinerant frequencies for possible activity. Order window enthusiasts will also find plenty to occupy themselves.

You'll Come!

The busiest period for tourist activity is from early spring to late fall, and scanner activity rises with the number of visitors. Check the listings included with this article; it's a good place to start your monitoring activity. But don't stop there. Put your scanner in the search mode and see what else can be found. The scanning potential is limitless.



Sevier Area Frequencies

All Freqs MHz

Local Law Enforcement

460.025 Sevier County Sheriff
460.050 Pigeon Forge P.D.
460.075 Sevierville P.D.
460.250 Gatlinburg P.D.
460.400 Mutual Aid

Fire Departments

453.850 Gatlinburg
460.175 Pittman Center
460.625 Sevierville-Sevier County
154.310 Seymour
154.175 Catons Chapel, North View, Pigeon Forge & 154.250 Waldens Creek, and Wears Valley

Sevier County Ambulance Service

462.950 Dispatch
463.000
463.025
463.050
463.075
463.100
463.125
463.150
463.175
451.400
155.340
155.280

Attractions and Accommodations

463.800 Dollywood
463.825
463.925
464.025
464.050
464.100
464.675
464.700
464.725

151.865 Ogles Water Park
154.570

Sevier County Emergency Rescue Squad

453.650 Dispatch and Page

Local Government

453.275 Gatlinburg
453.325 Pigeon Forge
453.575 Sevierville
453.925 Sevierville
155.775 Sevier County

157.620 Gatlinburg Aerial Tramway
462.800 Glenstone Lodge
463.550 Sheraton Gatlinburg
461.675 Dixie Stampede
157.680 Ober Gatlinburg
463.900 Family Inns
151.715 Holiday Inn Gatlinburg
461.625 River Lodge Sevierville
151.895 River Lodge Pigeon For

Great Smoky Mountains National Park

167.150
167.175



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Pigeon Forge Police Department.



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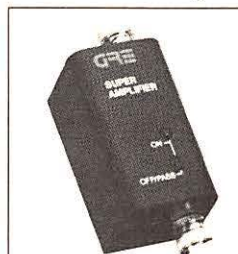
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Super Converter II



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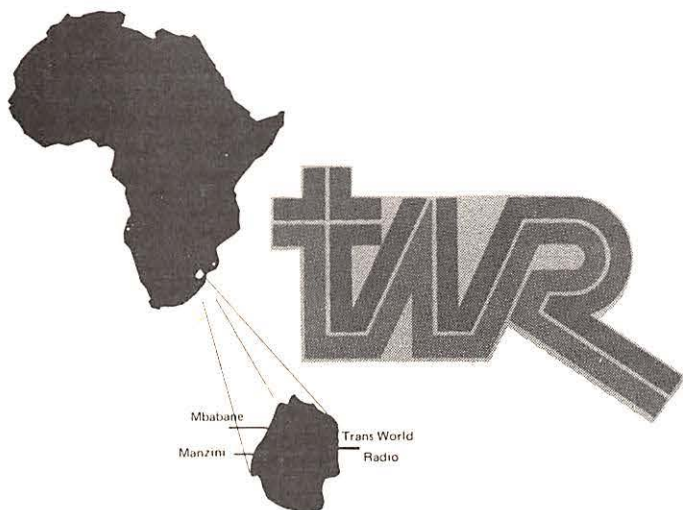
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Tuning in to Swaziland

By Colin Miller

In 1982, after a period of 60 years, the longest reigning monarch at that time died. He was King Sobhuza II, and his realm was the tiny but beautiful kingdom of Swaziland. Located in Southern Africa, Swaziland is an independent country tucked into the southeast corner of South Africa's Transvaal province. If you look at a map of the Transvaal and Swaziland, the outline of their borders resembles a man wearing a helmet, with Swaziland being his face.

Swaziland, with a population of only 882,000 is a little larger than Connecticut but still smaller than New Jersey. It is diversified in its landscape. The western part — the high and middle veld — abounds in valleys, mountains, forests and brooks which vary in altitude from about 6,000 feet in the west to 1,500 feet toward the east. The eastern portion, the low veld, is more level. Here you will find grasses and scrub trees which form protection for impala, zebra and other wildlife.

The Usutu Forest is the largest man-made forest in Africa, and covers the southwestern part of Swaziland. Here there are large pulp and paper mills. Asbestos is mined in the northwestern cor-

ner. The Havelock Mine is one of the largest asbestos mines in the world.

Large iron-ore deposits are mined at Bomvu Ridge in the northwest, and the first railroad from Kadake to Goba on the Mozambique border only opened in 1964. In the interior of Swaziland sugar cane is grown, and pineapples and citrus fruit are also grown and canned.

One of the most spectacular views can be seen just east of the capital Mbabane, where the Ezulwini valley stretches as far as the eye can see, some 3,000 feet below. Ezulwini means "heaven," and it is easy to understand why the valley is so named.

The Swazis are a branch of the Zulu nation, speaking Siswati, a language related to Zulu. Bantu tribes migrated from East Africa to southern Mozambique during the 16th century. A number of clans broke away from the main body in the 18th century and settled in Swaziland. In the 19th century they organized as a tribe, partly because they were in constant conflict with the Zulus. Their ruler applied to the British for help, and independence was guaranteed in 1881, although it took 87 years to finally materialize. Swaziland was part of

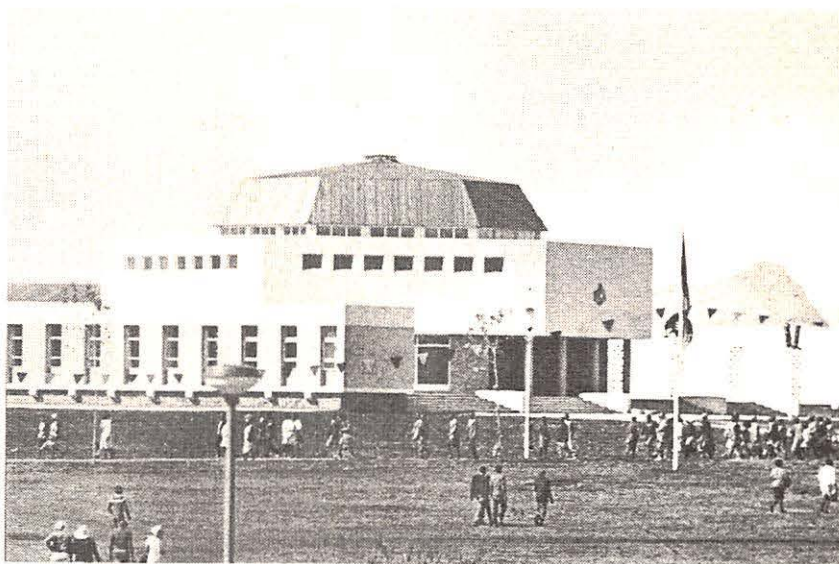
the Transvaal from 1894 to 1899, at the outbreak of the Anglo-Boer War. It was administered by Britain from 1902, when that war ended. Self government was attained in 1963 and it gained its independence on 6 September 1968.

Domestic Radio

It was only in 1965 that Swaziland acquired a broadcasting service, when the British military personnel operated Tiger Radio, a small 75 watt AM station from Manzini, Swaziland's commercial center. This station operated until independence.

Swaziland's modest domestic service, the Swaziland Broadcasting Service, was founded in 1966. The studios are located in downtown Mbabane and the original 10 kW mediumwave transmitter was located on a hill overlooking the town. This facility was replaced in the mid-1980's by a new high powered station of 100 kW at Sidvokodvo in central Swaziland. There is also a network of FM transmitters at strategic locations.

*Houses of Parliament
(with copper dome)
opened by Princess
Alexandria on
September 8th, 1969.*



Beaming on the Neighbors

In 1971 an American firm, Intermedia, secured an external authorization from the Swazi Government permitting the company to erect a station on Swazi soil for the purpose of beaming medium and short wave commercial broadcasts to South Africa and Mozambique. Around that time Intermedia also had plans to lease time over a 100 kW shortwave transmitter in Malawi, and Lakeland Radio operated for about two or three hours daily to Southern Africa.

Intermedia's Swaziland station, Swaziland Commercial Radio, started broadcasting in 1972, using one 50 kW mediumwave and two shortwave transmitters of 10 and 100 kW. The transmitter site is in the southwest at Sandlane, just inside the Swaziland border near the Transvaal town of Amsterdam. All programs are recorded at studios in Johannesburg and shipped to the station itself. Swazi Radio uses 6155 kHz in English at the following UTC times:

Mon-Fri	1700-2030
Sat	1700-1930
Sun	0500-0600 and 1800-2030

In 1976 the program format was changed from Top 40 to ethnic programming. Radio Truro (named for the ship that brought the first Indian labourers to work on the sugar-cane plantations in Natal) catered to East Indian Listeners, most of whom live in South Africa's Natal province and the Witwatersrand around Johannesburg. Radio SR served the urban Blacks whereas Paralelo 27 (the approximate latitude of Swaziland) was intended for the large Portuguese community. Many Portuguese listeners formerly lived in Mozambique before that country gained independence in 1974. All these services have since closed.

About a year ago the station underwent further changes, and Communities Broadcasting Services was established, introducing services in Portuguese, Italian and Greek. This station also uses the Swazi Radio facilities on 6155 kHz, at the following UTC times:

Radio Cidade (in Portuguese):	
Mon-Fri	0700-1000
Sat	0900-1200
Sun	1200-1500
Radio Cidade (in Portuguese and English):	
Sat	1200-1600
Transmissione Italiana (in Italian):	
Sat	0600-0900
Hellenic Heart Beat (in Greek):	
Sun	1100-1200


A Global Reach

The third station operating in Swaziland is a Christian station operated by an American missionary organization, Trans World Radio. In 1969,

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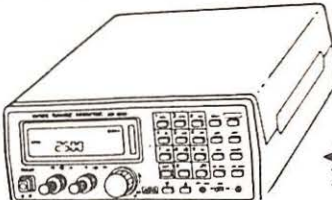
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7th March 1993 to 4th September 1993

negotiations commenced between TWR and a representative from the radio department of the Africa Evangelical Fellowship, another Christian mission. The AEF field headquarters was located at Roodepoort, just west of Johannesburg and not far from my home at the time.

These negotiations originally called for broadcasts to be transmitted from TWR's stations at Monte Carlo or Bonaire. I was asked by AEF to provide cabled reception reports to Monte Carlo. These tests, carried out in 1969 and 1970, proved reception to be unsatisfactory, owing to poor propagation conditions.

A few years later, permission was granted by the Swaziland Government for TWR to build a shortwave station near Manzini. After considerable research in the country, land was purchased in October 1973 and construction got under way on the Mpangela Ranch, 25 miles northeast of Manzini in an area surrounded by bush. A storage building was constructed from which the first transmissions took place.

On 4 December 1974, TWR Swaziland was officially opened. At first only one transmitter of 25 kW was in use, with five antennas. Today there are five shortwave transmitters in operation, three of 25 kW and two of 100 kW. The number of antennas has doubled and includes log periodic and curtain arrays. The Swaziland Electricity Board supplies the electrical power to the transmitters, while two diesel generators are used for standby electricity supply.

On 13 November 1992, the second 100 kW shortwave transmitter was dedicated. This transmitter was built by HCJB engineers in Elkhart, Indiana. Eventually all of the old 25 kW transmitters will be replaced by 100 kW units.

The ground floor of the new studio/office building in Manzini was completed in December, and there has been a good start on the exterior brick

work. May 1993 is still the target date for the completion of the entire project.

TWR Swaziland broadcasts in about 20 different languages, including Urdu and German. At the end of March 1981, TWR commenced testing a 50 kW mediumwave transmitter on 1170 kHz. It operates at night, mainly with contemporary Christian music programs.

The best chance to hear TWR Swaziland on the North American East Coast is around 0300

UTC, when a number of separate language services commence transmissions. Look for Ndebele on 3200 kHz and Shona on 3240 kHz, both beamed to Zimbabwe. Readers on the West Coast may be able to hear the transmission in Urdu at 1200 UTC on 15175 kHz, beamed to Pakistan over a 100 kW transmitter. Listen for their distinctive handbell interval signal.

Metre band	Swazi Time	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	
60/41mb	0630	Programme News	TWR Morning Programmes						Programme News
	0635	Music							Jump For Joy
	0645	Way to Life Hour							Storybook Room
	0700	Radio Bible Class	Back To The Bible						Young Life
	0715								Visit With Mrs. G.
	0730	Kerygma	Family Bible Hour	Gospel Tide Hour	Bringing Christ To The Nations	F.O.C.L. Point	Wesleyan Hour	We Kids	
60/41/25mb	0800	Music of the masters	Insight For Living, with Chuck Swindoll						The Storyteller
	0815								Lifting Up Christ
	0830	The Worship Hour	Stories Of Great Christians						Hour Of Freedom
	0845								Teatime talks
41/25mb	0900	Words Of Hope	Thru The Bible, with the late J. Vernon McGee						McGee Q & A
	0930	Answers							
	0945	Music	Focus on the Family						Unshackled
	1000	The Way To Life, with Dick Saunders							
	1005							Telling The Truth	Radio School Of The Bible
	1020	Close Down							
	1035							Close Down	

EVENING ENGLISH PROGRAMMES ON SHORTWAVE

90mb	2000	Hope For Today	Insight For Living, with Chuck Swindoll					Master Design
	2015	Way To Life Hour	Happy Side					
	2030	Radio Bible Class	Grace To You, with John MacArthur					In Touch
	2100	Telling The Truth	Family Bible Hour	Gospel Tide Hour	Bringing Christ To The Nations	The Word Today	The Wesleyan Hour	Hour Of Freedom
	2115				Drama			
	2130	Words Of Hope	Thru the Bible, with the late J. Vernon McGee					McGee Q & A
	2200		Rendezvous, with Dick Saunders					
	2215	The Worship Hour	Close Down					

ENGLISH TRANSMISSION TO EAST AFRICA

31mb	1800	Africa Challenge				
	1830	A New Dimension				
	2000		The Living Word			
	2015	Living Faith				
	2030		Power Line			
	2045	Close Down				

INTERNATIONAL LANGUAGE LISTING

Language	Target	Metreband	Local Times	Language	Target	Metreband	Local Time
Afrikaans	RSA	90mb	0630 (Wednesdays)	Portuguese	Angola	41mb	2000-2050
Chewa	Malawi	41/31mb	0600-0730/1800-1930		Mozambique	31mb	1640-1730
Chokwe	Angola	41mb	1945 (Thursdays)	Shangaan	Moz./RSA	60mb	1815-1845
French	Madagascar/Zaire	31mb	1815-1845/2130-2200	Shona	Zimbabwe	90mb	0500-0545/1945-2030
German	RSA/Namibia	90/60mb	0600-0630	Somali	East Africa	31mb	0345-0400
Humbi	Angola	41mb	1945 (Alt. Fridays)	Swahili	East Africa	41/31mb	0600-0630/2000-2100
Lingala	Zaire	31mb	2100-2130	Tshwa	Moz./RSA	60mb	1800-1830
Lomwe	Mozambique	49/31mb	0600-0615/1730-1745	Tswana	Botswana/RSA	90mb	1900-1930
Lunyanka	Angola	41mb	1945 (Alt. Fridays)	Umbundu	Angola	41mb	1945-2000
Malagache	Madagascar	31mb	1800-1815	Urdu	Pakistan	19mb	1400-1415
Ndebele	Zimbabwe	90mb	0500-0530/2000-2030	Xhosa	RSA	90mb	2030-2100
Pedi	RSA	90mb	1930-1945(Sun)	Zulu	RSA	90mb	1930-2000

Frequencies used by TWR (in kHz):

90mb: 3200, 3240, 3275 60mb: 4760, 5055 49mb: 6020 41mb: 7180, 7200, 7215, 7290 31mb: 9500, 9520, 9525, 9630, 9650 25mb: 11740, 19mb: 15175

Note: Local time is two hours before UTC.

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Frequency Coverage	Default Steps
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26,000 - 28,995 MHz (AM)	5.0 KHz
29,000 - 53,995 MHz (NFM)	5.0 KHz
54,000 - 71,995 MHz (WFM)	50.0 KHz
72,000 - 75,995 MHz (AM)	5.0 KHz
76,000 - 107,995 MHz (WFM)	50.0 KHz
108,000 - 136,995 MHz (AM)	12.5 KHz
137,000 - 173,995 MHz (NFM)	5.0 KHz
174,000 - 215,995 MHz (WFM)	50.0 KHz
216,000 - 224,995 MHz (NFM)	5.0 KHz
225,000 - 399,995 MHz (AM)	12.5 KHz
400,000 - 511,995 MHz (NFM)	12.5 KHz
512,000 - 549,995 MHz (WFM)	50.0 KHz
760,000 - 823,995 MHz (NFM)	12.5 KHz
849,0125 - 868,995 MHz (NFM)	12.5 KHz
894,0125 - 1,300,000 MHz (NFM)	12.5 KHz

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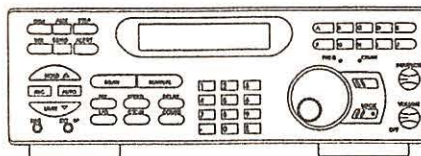
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Frequency Coverage	Steps
29,000 - 53,995 MHz (NFM)	5.0/12.5/25.0 KHz
108,000 - 136,995 MHz (AM)	5.0/12.5/25.0 KHz
137,000 - 173,995 MHz (NFM)	5.0/12.5/25.0 KHz
216,000 - 224,995 MHz (NFM)	12.5/25.0 KHz
225,000 - 399,995 MHz (AM)	12.5/25.0 KHz
400,000 - 511,995 MHz (NFM)	12.5/25.0 KHz
806,000 - 823,995 MHz (NFM)	12.5/25.0 KHz
849,0125 - 868,995 MHz (NFM)	12.5/25.0 KHz
894,0125 - 956,000 MHz (NFM)	12.5/25.0 KHz

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DXing the Land of Wars



Voices from Bosnia-Herzegovina

By Larry and Gayle Van Horn

Right in the center of Europe there is a killing ground. Hatred, jealousy and ethnic rivalry have been loose in this corner of Europe before. Four major wars have been fought in this century alone. Students of history know that World War One started with a shot that was fired in a town in the central portion of this region. World War Two saw a bitter conflict between two divisions of people from this land.

Recent history has demonstrated that peace is not impossible. In 1984, the eyes of the world were on this country which hosted the Winter Olympics. Athletes from around the world came to the town that started World War One to participate in the peaceful celebration of international competition.

But, once again the demons of rage and hatred have been set loose in Europe and there is danger here for the whole world.

...That danger is war!

Almost two years ago, in the "Land of Wars" — what was once Yugoslavia on the Balkan peninsula — civil war broke out in some of the former republics. So far the efforts to stop it have proved inadequate, and there is talk of stronger measures.

History and a study of the people from this region of Europe help one get an insight into this major conflict. Religion, language and territorial ambition have all fueled the civil war.

A Look Back

The country of Yugoslavia came into being at the end of World War One. In 1918, Yugoslavia was carved out from the two defeated Austria-

Hungary and Ottoman (Turkish) Empires.

After World War II, the Communist party took over the six Slavic republics and two provinces and formed a central government with Belgrade as the capitol city. The Communists managed to hold all the parties in check until June 25, 1991. On this date, two of the republics, Slovenia and Croatia declared independence.

The name Yugoslavia means "Land of the Southern Slavs." There are six Slavic nationalities in the six former republics (in order of size): Serbs, Croats, Bosnians, Muslims, Slovenes, Macedonians and Montenegrins. Serbs, Bosnians and Croats make up Europe's largest ethnic group and all speak roughly the same language.

Here is a brief look at the six republics, with some recent history and how they relate to each other in the ongoing conflict.



Several international and humanitarian organizations have struggled to maintain a calming presence in the face of ancient hatreds and new atrocities.

Photo courtesy of Canadian Forces.

1. Serbia: Capitol - Belgrade. Religion - Eastern Orthodox, same as their Russian neighbors to the east. Area - 34,116 square miles. Population 9.3 million people. Serbs make up 85% of the population. Serbs use the Cyrillic alphabet and their language is Serbo-Croatian.

The Serbian people fought for Communist partisans in World War II in resisting the German Nazis. They also fought the Germans in World War One. Most of the recent aggression in the current conflict was started by the Serbians.

2. Croatia: Capitol - Zagreb. Religion - Roman Catholic. Area - 21,829 square miles. Population 4.6 million people. Croats make up 75% of the population and Serbs contribute 12% of the population. Croats use the Roman alphabet and speak Croatian.

During World War Two, Croats fought brutally against the Serbs for the German Nazis. For years they have claimed that they should be independent from the rest of the Yugoslav republics because of differences in language and religion. In June of 1991, Croatia declared their independence.

There was one major problem. Croatia had 700,000 Serbs in the newly independent country. Serbian leaders who were determined to create a bigger Serb empire sent the Yugoslav army into battle. Croats fought the Serbs but were outgunned. Thousands of Croats were killed and hundreds of thousands forced to flee.

The most savage battle was for the city of Bjelovar. Hatred that had been building for hundreds of years could be seen between Serbs and Croats. Revenge for the violence of fathers and grandfathers in World War II manifested into fierce fighting which has since stopped. Now the Serbs and Croats have turned their attention to another of the former republics — Bosnia.

3. Bosnia - Hercegovina: Capitol - Sarajevo. Religion - Muslim. Area - 19,741 square miles. Population - 4.1 million people. The population make-up of Bosnia is: 43% Muslim, 31% Serbs and 17% Croats. Most references to this republic shorten Bosnia-Hercegovina to simply Bosnia.

Serbs, convinced that Bosnians and Croats that lived in Bosnia would vote for independence, found that unacceptable. Consequently, when Bosnia announced its independence from the former Yugoslavia on March 3, 1992, an all-out civil war began almost immediately. On March 22 ethnic Serbs began attacking Muslim and Croat areas in Bosnia, aided by the Yugoslavian Federal Army. By August 1992, Serbs had seized 70% of Bosnian territory.

In October and November of last year, Bosnian Muslims came under attack from their neighbor to the west. Croats attacked them trying to claim territory they deemed vital. As late as the end of

April into the first of last month, Croat and Serb forces continue to pound this republic, much to the horror of the rest of the world.

The European community and the United States government officially recognized Bosnian independence on April 7, 1992. On November 20th, the NATO allies began a naval blockade to enforce a United Nations embargo against Yugoslavia which had first been enacted on May 30, 1992. This is a blockade of Serbia and another Yugo republic siding with the Serbs, Montenegro. To date the blockade has been called ineffective by western sources.

4. Slovenia: Capitol - Ljubljana. Religion - Roman Catholic. In June of 1991, Slovenia (the westernmost republic) declared its independence. Area - 7,819 square miles. Population - 1.9 million people. Slovenes make-up 91% of the population. People in Slovenia speak Slovenian and Serbo-Croatian languages.

The Yugoslav army led mostly by Serbs made a half-hearted attempt to stop Slovenia from declaring independence in June 1991. Serbs do not constitute much of the Slovene population, so Slovenia was left alone by Serbia and allowed to start its own country. So far, they have stayed out of the Civil War that has dominated the other former Yugoslav republics.

5. Macedonia: Capitol - Skopje. Religion - Eastern Orthodox Church dominates. Area - 9,928 square miles. Population - 1.9 million people. The population is comprised as follows: Macedonians 67%, Albanians 20%, Turks 5%.

The Macedonians have not been involved in any of the fighting, but they keep a constantly wary eye to their north for possible Serbian incursion into their country.

6. Montenegro: Capitol - Titograd. Religion - Eastern Orthodox Church. Area - 5,333 square miles. Population - 584,000 people. Montenegrins make-up 69% of the population, Muslims 13% and Albanians 6%. Serbo-Croatian language dominates and the people use the Cyrillic alphabet.

The Montenegrins have backed the Serbs in the current conflict and have aided Serbian fighters in other areas of the region.

Listening to Broadcast Voices

Now that you have an idea who the principals are in this Civil War, it's time to turn our attention on how to monitor this powder keg. Most of the broadcast activity in the region can be found on the AM broadcast band. European listeners are well placed to hear some of the former republics and should watch the frequencies in Table 1 for activity.

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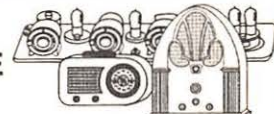
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Hrvatski Radio in Croatia has also been heard on shortwave, carrying the first program of the network in Croatian. Check 5085, 6145, 6511, 9830 and 13830. The broadcasts are listed as 24 hours and English news broadcasts have been heard at 0703, 0903, 1003, 1303 and 2203. Croatia Radio has also been relayed via WHRI-Harvest Radio, Noblesville, Indiana, on 7315 and 15105 kHz at 0000-0100 Saturdays UTC 0400-0430 and 0500-0600 on 7315.

Radio Bosnia-Herzegovina has been heard drifting around 6220 kHz. Europeans should listen around 1700; in North America check for signals around 0200 until 0404. Programming reportedly consists of easy listening music, time pips and frequent identifications. This station has also been heard using WHRI facilities. Check Thursdays UTC at 0100 on 7315 kHz. Languages used include English and Serbo-Croatian.

The main foreign service broadcaster in the region continues to be Radio Yugoslavia, which is under Serbian control. Look for English broadcasts to North America on 9580, 11870 at 0030-0100 to North America; 9580 at 0130-0200 to North America; 21605 at 1130-1200 to Australia; 6100, 17710 at 1830-1900 to Western Europe/Africa; and 6100, 9505 at 2100-2130 to Western Europe. Look for the program "The Radio for the Bosnian Serbs" broadcast in Serbian at 2025-2030 on 6100 and 9720 to Europe. The North American broadcast can be heard at 2355 on 9680 in Serbian.

Listeners should also check for news of the region on major European broadcasters (e.g.: BBC, Deutsche Welle, Switzerland, etc.) and on the Voice of America in the United States. The frequency section in each month's *MT* will give you

Table 1: Mediumwave Broadcasters

Station	Country	Location	Freq (kHz)	Power (kW)
Radio-Television Sarajevo	Bosnia	Sarajevo	612	600
		Sarajevo	945	100
Hrvatski Radio	Croatia	Zadar	1134	600
Radio Pristina	Kosovo	Pristina	1413	1000
Radio-Television Makedonje	Macedonia	Skopje	810	1000
Radio Podgorica	Montenegro	Podgorica	682	600
Jugoslavian Radio-Television	Serbia	Beograd	684	2000
Radio-Television Slovenia	Slovenia	Ljubljana	918	600
Radio Novi Sad	Vojvodina	Sombor	1269	750

Table 2: Yugoslavian (Serbian) Embassies

75 Baud RTTY; #—FEC-A mode

DFZG - MFA Belgrade, Serbia

5309.0#	5312.0	7805.0#	7808.0
9046.0	9397.0#	10316.8#	10332.0
10802.0#	11139.0	11149.0	12192.0#
12216.0	13392.0#	13388.0	13398.0
14652.0#	14674.0#	14676.0#	14907.0
14912.0	16298.0	16302.0#	17432.0
18032.0	18042.0	18055.0	18425.0
18972.0	19217.0	19227.0	19233.0
20132.0	20139.0	21859.0	21882.0
22888.0	24102.0	25022.0	26208.0

Ottawa, ON, Canada

16314.0 20890.0

Havana, Cuba

20134.0

Embassy transmissions from an unknown location:

16306.0 20135.8 21862.0

Band (USB) frequencies to monitor include:

3092 4704 5690 6705
9006 11233 13231 13257
15031 18012

French forces in Sarajevo, Bosnia, have been reported using 10168.2 kHz ARQ-M2 and 11003.0 ARQ-E.

The Italian Air Force has been reported transmitting from Sarajevo on 13220.0 kHz in USB.

If United States forces are committed to the conflict, the first frequencies you should check should be the Global HF System frequencies. Look for activity in USB on: 4725 6738 8967 8993 11176 11243 13201 15015 17975 kHz.

United Nations forces have also been involved in humanitarian efforts. These forces have been heard from Bosnia-Herzegovina using the following frequencies:

USB: 5310.0 6721.5
(Alpha-Numeric Callsigns)
SITOR-A: 5752.5 (Sarajevo)
ARQ-M2: 5397.7 7451.7 7642.7
10980.7 10168.3 11003.0 11416.7 16165.2

the complete English language schedules for each hour of the day for these broadcasters.

Utility Communications

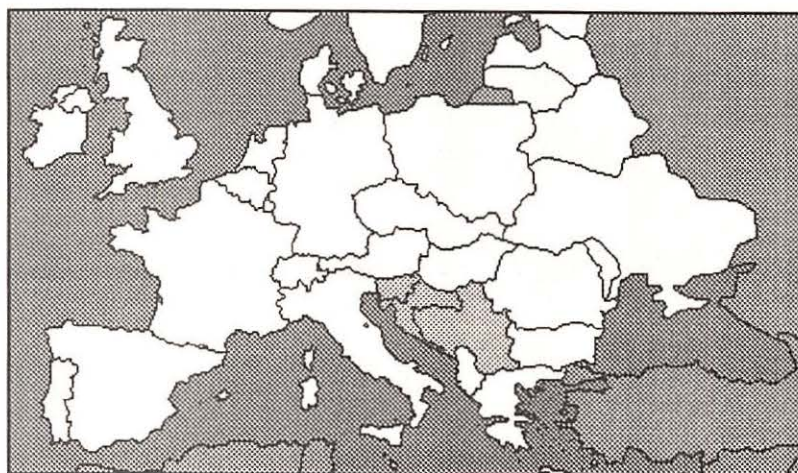
Shortwave utility listeners also have targets of opportunity to hear the conflict in the region. Most of the activity will be from agencies involved in humanitarian work in the former republics.

Several countries have been involved in relief efforts in Bosnia. Look for Canadian forces' activity on Canadian Military Aeronautical Communication System (MACS) frequencies for Lahr Air Base in Germany. MACS' Upper Side

Look for International Red Cross activity from Nabja Luka, Bosnia; Belgrade, Serbia; and Zagreb, Croatia, using 6996.0 in USB and SITOR-A on 6999.5 kHz.

Former Yugoslav embassies now belong to Serbia. These embassies use digital transmission modes for communications. The Ministry of Foreign Affairs (MFA) and Embassies use mostly 75 baud RTTY. Some FEC-A transmissions indicated by a '#' have been observed. Table 2 is a list of recently reported frequencies.

War has erupted before in this corner of the Balkan Peninsula. Each outbreak breeds new hatreds.



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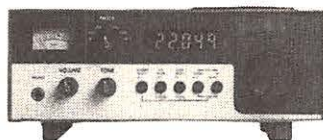
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Table 3 lists embassies transmitting from Belgrade to their Ministry of Foreign Affairs home offices.

Serbia also controls the TANJUG Press service. Listeners equipped to monitor RTTY transmissions should look for press bulletins from Belgrade, Serbia, using 50 baud on the schedule in Table 4.

The eastern Bosnians set up their own news agency, called DRINA, in February of 1993. The main goal of this agency is to break the information blockade affecting areas in southeastern Bosnia, Sarajevo, and Bosnia-Hercegovina. It is unknown at this time if this news agency is currently transmitting in the shortwave spectrum.

In the private sector, there have been many reports of communications by amateur radio operators who are sometimes a community's only line of contact with the outside world. See the "DX Tips" on page 53 for suggested times and frequencies.

The former Yugoslav Aerotransport is now run by the Serbs. Called Serbian Aerotransport, aero buffs should look for activity on 11228, 13248, and 17975 in USB.

Marine radio buffs should look for activity from the following stations:

YUW - Bar Radio, Serbia

USB: 4405.0 6501.0 8797.0 13095.0 17353.0

9AR - Rijeka Radio, Croatia (DE + V Marker)

CW: 4346.0 8445.0 8700.0 12780.5 16942.8

SITOR-A: 8421.5 8427.5 12604.5 12607.5 16838.5

USB: 4378.0 4411.0 6504.0 6513.0 8746.0 8749.0

8806.0 13146.0 13161.0 17272.0 17320.0 22705.0
22711.0 22810.0

9AS - Split Radio, Croatia

USB: 4357.0 6510.0 8782.0 13155.0 17293.0

There are many good reasons to follow events in the former Yugoslavia via your shortwave radio. Chances are good that the war will widen. Calls for the United States to become involved ring in the halls of Congress and throughout Europe. Only time will tell what will happen in this turbulent corner of Europe.

Table 3: Embassies in Belgrade

Country	Call	Freqs	Transmission Mode
Czechoslovakia		10610.0	75 baud RTTY
Egypt		11528.7 11571.7	SITOR-A/B
France	G8T	11050.2	ARQ6-90/200
Italy		9283.0	ARQ-E
Sweden	SAM35	13863.0 18691.0	Swed-ARQ
Switzerland	HBD40	7661.5 10956.0	SITOR-A
Turkey	YML2	13953.0 14474.0	FEC-A/144

Table 4: TANJUG Press Service RTTY

Call	Freq	Lang	Schedule	Target
40C3 -	5112.0:	SC	0700 - 0400	
40C2 -	5240.2:	EE	1700 - 0400	EEur, EAfr, MEast
YZD6 -	7592.1:	FF	1900 - 2000/2100 - 2200	
YZD -	7658.0:	EE	0400 - 1700	WEur, WAfr (Sunday/Monday 0900 - 2200)
YZD7 -	7806.0:	EE	1700 - 0400	Far East
YZD9 -	7996.0:	EE	1700 - 0400	SE Asia
YZJ3 -	11604.0:	EE	0400 - 1700	SE Asia
YZO7 -	12212.9:	EE	0400 - 1700	EEur, EAfr, MEast
YZJ5 -	13440.0:	RR	0000 - 0400	Russia
		EE	0400 - 1700	Far East
YZJ6 -	15705.0:	FF	1100 - 1400	
YZI4 -	16343.0:	EE	1300 - 1400	EAfr
YZJ4 -	19865.0:	SS	1400 - 1600	
		SC	1600 - 1800	
YZJ -	20204.0:	EE	1300 - 1400	SAfr

In the former Yugoslavia, demons of the past and of the present walk side by side. The occupants of this territory have distrusted each other for centuries and have come to hate each other. Now the land has turned once again into a killing ground. The conflict is likely to continue into the foreseeable future, so tune in your shortwave radio to the various voices from the "Land of Wars."

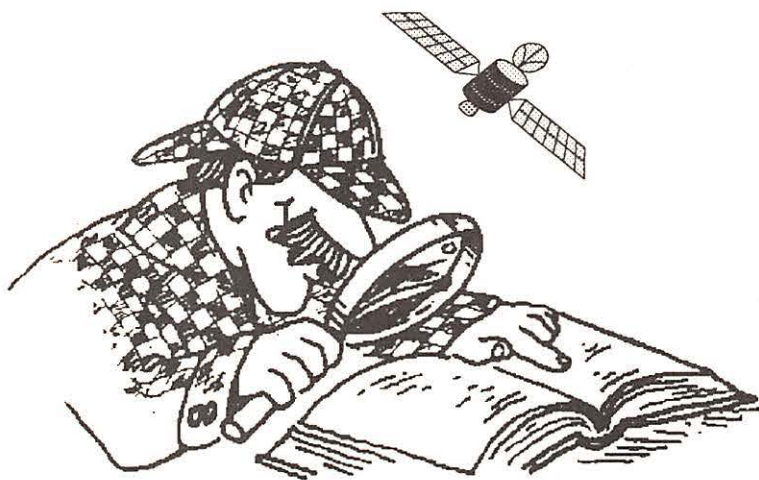
M_T

Canadian Forces, which maintain a presence in Europe as a participant in NATO, are one of several units monitoring the conflict in Bosnia. They can be heard on several USB frequencies for Lahr Air Base in Germany.

Photo courtesy of Canadian Forces.



The Case of the Vanishing Satellite



“It Was a Dark and Stormy Night”

By Theo Pappan

A typical summer thunderstorm was working its way across the midwest and it seemed to have driven all the radio signals from the air. As I sat at my radios, it was quiet except for an occasional crackle of lightning in the distance. I tuned back and forth across the frequency looking for the first indication of a signal. Nothing. I glanced at the clock, it was just past 02:30 am. The anticipation was building; would the signal be there? How strong would it be? So many questions, and all I could do was wait. Wait and listen.

I rocked the tuning knob back and forth for the ten-thousandth time and then stopped. What was that? A bump! Now I tuned back more slowly. Yes a signal, definitely. It was the signal I was looking for. I grabbed my pen, looked at my watch, and scribbled in my log “14 Jul 92, AoS (Acquisition Of Signal) 06:32:10, 137.4043 strong signal.”

I tuned the signal in again; it was changing — relentlessly, slowly, constantly dropping in frequency. I listened closely to the speaker as the signals came out of the black of night and space. Yes, it was there. The telemetry was clear. It was still working.

I punched the dialer on my phone and the beeps found me another phone a thousand miles away. A voice answered. “Give me Charlie,” I requested urgently. The signal was stronger now, and I checked the time against a computer printout in front of me. Right on time. Another voice came on the headset. “What’cha got?” “It’s back and right on time,” I said. “Is it still working?” he asked. “Still transmitting data loud and clear, and no sign of tumbling or loss of attitude control,” I replied. “Listen...” I turned up the volume on the speaker a bit and leaned forward so that the headset mike could pick up the sounds coming from a satellite hundreds of kilometers away in space, streaking by me in its race around the Earth. A race it was about to lose.

The satellite was an Indian spacecraft launched only a few weeks before on the 20th of June from the Sriharikota Launch Center on the other side of the world on the East coast of India. Normally these birds stay up for several years, but this one had a problem. The final stage of the rocket, that was to push it into a safe orbit far above the Earth’s atmosphere, had failed. So it was left stranded, helpless in this dangerous place, halfway between heaven and hell.

If it had gotten a little higher in the heavens it would have been safe for many years, but down here at this altitude it was facing an early burn up in a fiery re-entry. Stuck in the fringes of our shallow atmosphere, every time it went around the Earth in its orbit, it slammed into a few more atoms of rarefied air, slowing it down. More than a dozen times a day it sped around the planet and every time it hit a few more atoms of gas. Each impact was incredibly tiny, but with the thousands of contacts per minute now growing into millions, the total effect was to slow it down and drag it lower into the atmosphere which meant it ran into even more resistance. Slowly, inexorably, it was falling back to Earth. At several thousand miles per hour.

I noted in the log, “LoS (Loss Of Signal) 06:39:10” and the frequency was down to 137.3978 MHz by then. The next pass was predicted to occur at 08:03 UTC, about an hour and a half from now. Would it return? Would it make it one more time around the Earth or would the relentless pull of gravity bend its supersonic flight path into the dense air we breathe, where the tremendous friction would burn it up in a few seconds? Would someone, somewhere, just happen to be looking up and see another “falling star” streak across the night sky?

The wind drove the rain against the side of the house as I waited inside remembering the first time I heard the voice of this voyager in space.

Recruited into the Network

It was the 21st of May, a few months earlier, when I received a call from Charlie. He was reporting reception of unknown signals around 137.4 MHz, a popular APT (Automatic Picture Taking) satellite frequency. APT satellites orbit the Earth over the poles and are therefore called polar orbiting satellites. They transmit images to simple ground stations on frequencies like 137.3, 137.4 MHz etc. Charlie is one of hundreds of ordinary people that receive these “pictures from space” on their own weatherfax machines or computers. A signal had appeared and it was not transmitting the usual APT signal!

The first thing I did was to check the orbits of the operational polar satellites put up by the US and CIS (ex-USSR). Nothing matched. I wasn’t expecting a new launch by either country or by China (the third country that launches this type of satellite).

I immediately started a “watch” on the frequency, monitoring the radio closely about 90 minutes from the last time it was heard (satellites of this sort typically take between 89 and 105 minutes to make one orbit of the Earth and come back into range). Nothing was heard for the next two possible orbits and I deduced that the satellite had moved west of me and could not be heard again until the next morning.

22 May 1992 03:51, I hear signals on 137.401. I check the location of all known APT satellites: nothing matches. The signal finally fades out at 04:00 on the UTC clock. I consider the implications of what we have heard. First, the signal is undoubtedly from an orbiting satellite, as the frequency of the signal apparently changes, shifting downward with time. This is the “doppler effect” that causes the listener to receive a transmission at a frequency that is higher than the transmitted frequency if the

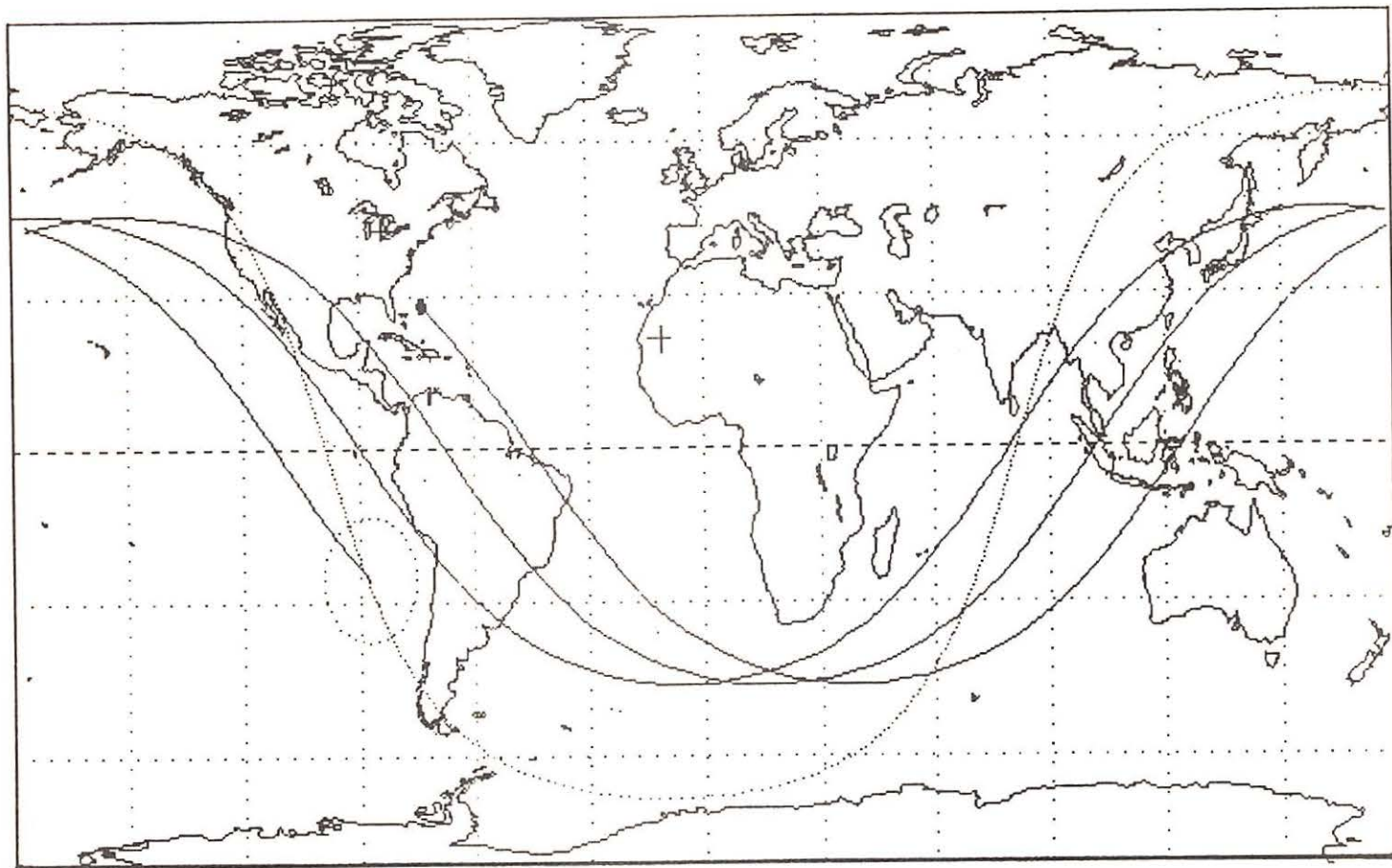


Figure 1: *Ground track of Indian SROSS-3 satellite from when it was last heard by the author until it reentered the Earth's atmosphere and burned up. Could you have heard it?*

transmitter is moving toward the receiver, and lower if it is moving away.

Isay *apparently* changes because the satellite's transmitter doesn't actually change in frequency. The high relative velocity of the receiver and transmitter in relationship to each other cause the speed to be added to the transmitted frequency when they are coming at one another, and subtracted from the transmitted frequency when they are going away from each other. For transmitters and receivers that are both on the Earth, or even in an aircraft, the speeds are not sufficient to amount to a noticeable shift in received frequency. However, when we are dealing with satellites with speeds of up to 25,000 miles per hour, it becomes a significant 2-3 kHz at 137 MHz and proportionally more in the UHF and SHF bands.

Second, the signal is not coming from a known APT satellite. I don't think it is a new weather satellite because it is transmitting data (telemetry) in a manner completely unlike a weather imaging comsat (short term for communications satellite).

So what could it be? It could be a satellite launched years ago that has come back to life for one reason or another. (We call them ImHoTeps after the architect and Grand Vizier of the ancient King Zoser of Egypt. So great and powerful he was, that in Egyptian mythology he came back to life as a god to protect his Queen Isis.) ImHoTeps are far

from rare and have been known to come and go several times. This signal had data on it, however, and old satellites usually lose their telemetry data when sensors or the spacecraft controller dies. When they come back from the dead, years or decades later, they are usually just empty carriers. So it probably wasn't an ImHoTep.

22 May, 05:27 AoS. It's back! 1 hour and 36 minutes since the last time I copied it. That's 96 minutes. Typical for a LEO (Low Earth Orbiting) satellite. It's the same signal and data pattern. It's beginning to look very much like someone has launched a new bird.

22 May, 06:58 AoS. Again, same signal. 91 minutes since last orbit.

Now we were getting somewhere. Charlie was calling in and had been confirming the same signals even though he was several states away. (This is one of the great things about satellite tracking; people in other states and even other countries can copy the same signals. Sometimes even at the same time.)

A Process of Deduction

I began to form in my mind an analysis of what this thing might be. I fell into my "Sherlock Holmes Mode" of problem solving.

I considered all I knew about the unknown

signal. Orbital period of between 89-98 minutes, *not* launched by the US, USSR, CIS, or Japan. From among the possibilities I eliminated anything but a transmitting payload (no rocket bodies and no debris from explosions) and anything in a polar orbit. All that remained were a handful of candidates and, surprisingly, all but one were from the same country. Charlie (my Watson) turned and looked at me. "You've stopped. Have you figured it out?"

I placed my pipe on the mantle. "Elementary, my dear Watson." I turned and strode across the room. "Have a seat, old boy, and I shall tell you the whole story." Closing the window to the cold wind I looked into the sky where dawn was just rising.

"You see Watson, we know it's a comsat in a low orbit between 300 and 600 kilometers, because it takes about 98 minutes for it to make one orbit around the Earth. We know it's a new launch and not an ImHoTep because it's transmitting good telemetry. We also know that the US, Japan or ESA (the European Space Agency) didn't launch it as they don't use the frequency of 137.4 MHz these days. The CIS could have launched it — they do use that frequency — but the timing of the orbit indicates that it was launched from a site south of their normal launch complexes."

Watson muttered, "Well, knowing who didn't launch it doesn't help us very much." I spun

around. "Ah, but it does, my dear Watson! It eliminates who it cannot be, and leaves us with the only possibility of who it can be," I said conspiratorially. Watson leaned forward. "You mean you know who launched it?" he asked incredulously. "You know who launched this mysterious satellite that passes over our heads several times each day?"

"Indeed I do, my old friend — India," I said simply. "They have used this orbit several times before and indeed have used similar frequencies in the past with their Rohini series of spacecraft." Dr. Watson stood up full of excitement. "India. By George, who would have thought of it. Amazing Holmes, and all of this from these simple signals?" "Elementary, my dear Watson." I yawned and closed my eyes, "Please fill in Lestrade while I take a nap."

The radio came alive with the signal of the dying spacecraft. I wrote in my log: "AoS 08:03:50 137.4040 strong signal both upper and lower telemetry channels OK." I was alone now, Charlie had given in to sleep as it was after 4 am local time. I listened to the telemetry channels 25 kHz above and below the center frequency. They were both filled with constant data.

I remembered thinking when I first discovered them back in July, "How convenient and simple a data downlink system this was. All you had to do was follow the reasonably strong unmodulated signal in the middle and the data would always be available right there 25 kHz on either side."

Another satellite, that time an ImHoTep, had transmitted a similar multiplex pattern. It was Ariabhta. That time the signals were 5 kHz above and below the center carrier. That was an Indian comsat also. And like this new comsat, the data being sent down was scientific information about that still largely unknown area of space that is close about our home planet.

The signal faded out and I entered in the log "LoS 08:09:50." I was never to hear the signal again. Its orbit moved it further and further to the west, out of radio range. Exactly four hours thirty nine minutes and ten seconds after its signal faded from my radio speaker, someone in the South Pacific off the coast of Chile looked up and saw a sparkle of light burst among thousands of stars in the black night and streak to the southeast for a brief few seconds of brilliant excess, and then it went out and was gone forever.

And so vanished that friendly little satellite that obediently sent back to its home planet all the information it could gather in its short lifetime. SROSS-3, 1992 028B, Catalog # 21968 had made its last mark in the record book and the people at the Indian Space Research Organization had reels of data on tape to analyse for years to come. Already, work was beginning on the next mission.

I faxed my observations to Geoff Perry in England, where they would become part of the final chapter on that one entry out of thousands in

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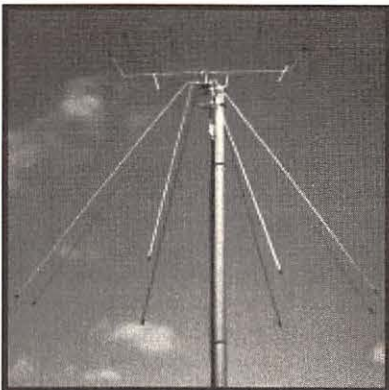
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the Royal Aerospace Establishment Table of Earth Satellites. Just another line of type on another page, but for me it had been a real world detective story, played out in real time, from birth to death.

Waiting in the Wings

There are over 7,000 objects in orbit around our Earth. Over a thousand of them have transmitters on board. Many have served their mission and been turned off, others have failed, but hundreds are still transmitting — some, after having been off for years. Tom, a recent convert to radio satellite tracking, went home after being exposed to this contagious “bug” and within a half hour had discovered a mysterious radio signal on 137.56 MHz.

We worked to track it down, and were surprised to find out that it was Prospero (X3), a British satellite launched on 28 Oct 1971. It had served its mission and was turned off. Ten years later its transmitter was switched on again, briefly, on its launch anniversary date and had been off since then — at least, that is what we thought. This newcomer had snagged a satellite that had not been reported in 11 years (and earned himself a footnote in the history books)!

If a real life mystery interests you, it can be yours for little or no investment other than your time. These signals are to be heard in the 137-138 MHz satellite band which they share with the daily working APT weather satellites. (See chart for APT frequencies.) Any radio, whether it be a simple police/fire scanner with this band included or the top-of-the-line Icom R-7000 (which seems to have been designed for this type of monitoring), can be used to find and track these signals from space.

They orbit the Earth constantly and in such numbers that you can pursue them weekdays, weeknights, weekends, holidays... anytime! The middle of the day or the middle of the night will find these objects going overhead and putting out strange signals.

The recent launch of a spy satellite (photo reconnaissance) by China provided over a week of tracking and monitoring as it flew over every inch

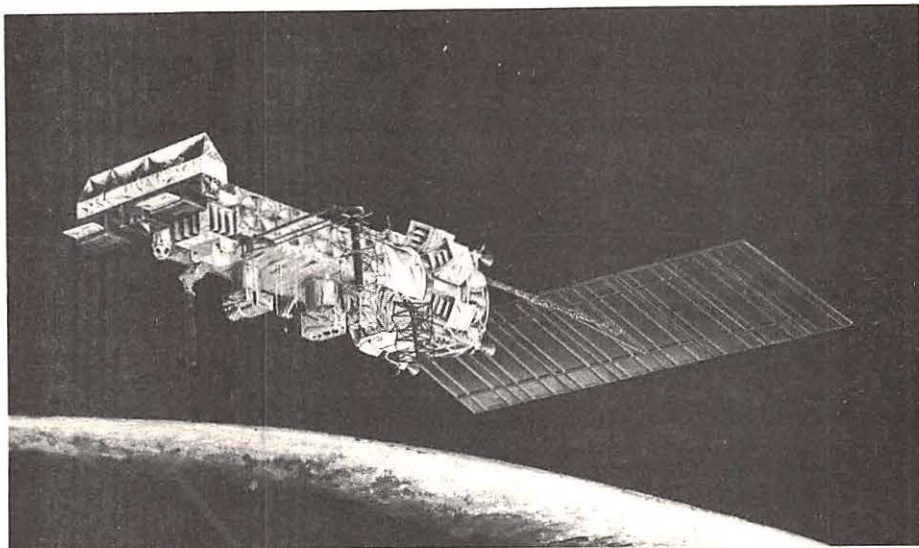


Photo courtesy of RCA.

of the Earth taking photos and then separated the film canister to de-orbit it for recovery back in China. Those who listened even knew from the received signals when the reentry module had been ejected from the main spacecraft.

How to Become a Satellite Sherlock

To check out your receiving system, set your radio on one of the frequencies noted in the “Satellite Beacon and APT Frequency List” and see if you can hear them. A standard test of your system would be to listen to one of the NOAA (9,10,11,12) weather satellite beacons on 136.770 or 137.770 MHz. These comsats transmit a low-powered beacon on those channels and, if you can hear them, you can hear an ImHoTep. An omnidirectional antenna is best to start with, so you can concentrate on listening and not on pointing an antenna.

If you can hear the NOAA beacons, then start by listening over the entire band from 137-138 MHz. The loud and strong beeping of APT will soon become familiar and you can pass it by (unless you hear it on 137.279, 137.035 or 137.795 MHz.

That would be a new Chinese weather satellite or a missing Russian bird. If you DO hear something on one of these frequencies, report it immediately!).

The signals you are looking for are weak, and may be dead carriers or have data on them. Use NBFM (Narrow Band FM) or SSB to hear the weak signals. Beware of birdies or signal splatter from the nearby ham band and interference caused by other devices. You know you have a satellite when its frequency seems to change smoothly and constantly. You will need to continually retune to follow it. Scanners with a search function can be used to find a signal and then can be manually stepped up or down in 2.5 or 5 kHz steps to follow the doppler effect.

Always record the AoS/LoS times (when you first hear it and when you lose it). Make a note of the frequency as accurately as possible and write down what the signal sounded like, strength and any beeps, tones, pulses etc.

When several people compare notes on what they have heard, it makes determining a satellite's orbit and identifying it much easier. The author is dedicated to this activity full time and has made available a BBS for those who are interested, to pass along reception reports and receive the latest orbital information on satellites of interest. Report what you hear by computer modem to our BBS at 517-743-5077. You can send a fax to the same number. If you don't have a modem or fax machine available, call me at 517-743-5779 NOON TO 10PM EASTERN TIME ZONE (USA). Your report could be the one that solves the puzzle.

WARNING! This hobby is EXTREMELY ADDICTIVE and you may lose many hours of your life every week playing Sherlock Holmes. The rewards are unequalled, however, when you are the first or last person on the Earth to hear the signals of a messenger from space!

Satellite Beacon and APT Frequency List

Frequency	User	
136.770	TIROS BEACON	(USA)
137.035 *	FengYun APT	(China)
137.279 *	Cosmos APT	(CIS)
137.300	Meteor APT	(CIS)
137.400	Meteor/Okean APT	(CIS)
137.500	TIROS APT	(USA)
137.620	TIROS APT	(USA)
137.770	TIROS BEACON	(USA)
137.795 *	FengYun APT	(China)
137.850	Meteor APT	(CIS)

* Report any signals heard on these frequencies.

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GROVE--BRINGING THE WORLD A LITTLE CLOSER TO YOU.

Low Power FM Broadcasting Comes to Drive-in Movies

By Ernie Blair

In the city of Huntsville, Alabama, summer drive-in movies will never be the same since non-commercial FM broadcasting arrived on the scene. It happened last summer when I was approached by an old high school buddy who directs the City of Huntsville Parks and Recreation Department (COHPAR). Ralph Stone had a problem he didn't know how to solve, but he was aware of a resource to get the answer he needed — the radio hobby!

Knowing that I had been involved in ham radio since high school, Ralph presented me with an opportunity to apply some things learned from the hobby to a unique public service application — COHPAR's summer drive-in movie series at the site of a former commercial drive-in theater.

This was the third year movies had been shown by the city and it had become the cool thing to do on hot summer Tuesday nights. A screen was erected by COHPAR, but the classic drive-in speakers for each individual car had long since been removed by the property owner; otherwise, the site was perfect for the summer entertainment.

In the past, the city provided audio for the audience by setting up a loudspeaker system on top of a portable stage housing the movie projectors and located in dead center of the parking area. This works out well for those who bring lawnchairs and

sit out under the stars, but does not provide adequate sound delivery for those who prefer to sit (or whatever) in the car.

Ralph asked if there was some way the sound could be "broadcast" from the projectors directly to the cars. The quest for a solution was begun. Knowing that most cars today are equipped with quality FM receivers, we began the search for a low-power FM broadcast system. We quickly discovered that the ones sold for commercial applications are cost prohibitive for an operation charging a minimal admission fee and seeking to break even on expenses over the course of the summer.

Not knowing what to do next, a set of criteria was drawn up for a suitable broadcasting system. The system must be:

- Inexpensive to purchase and operate
- Completely legal
- Provide sufficient coverage for good fidelity to every car at the drive-in regardless of location
- Frequency stable for finicky digitally-tuned car radios
- Incorporate a rugged design to withstand any "trained gorilla" volunteer who may set it up
- Be operable by non-technical folks, so that I would not personally need to attend every movie in order to assure success

The Solution

At hamfests, I had seen the FM-10, an inexpensive FM Stereo transmitter kit, sold by Ramsey Electronics for \$29.95 plus another \$12.95 for a functional and attractive case. The low price made me a little skeptical at first, but at the Birminghamfest I broke down and purchased one to test out. After constructing the kit and experimenting in my neighborhood, I was pleasantly surprised at its overall value. The FM-10 comes with an informative instruction manual, which not only discusses theory and coverage possibilities with an external antenna, but also addresses at length the legality of broadcasting with such a device. The assembly instructions are clear and simple. Construction requires only a few basic tools and minimal electronics experience.

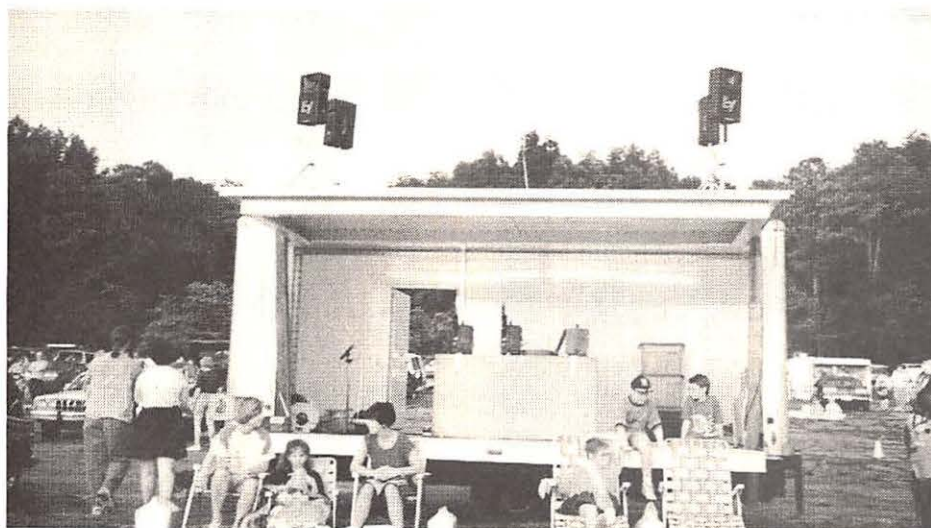
The Ramsey FM-10 provided everything we needed once an external antenna was added and a few simple modifications were made. We put the FM-10 "on-the-air" starting with the first movie of the summer.

The FM-10 is a stereo transmitter, but it was found that setting the subcarrier circuitry at the proper multiplex frequency for stereo transmission was a bit touchy. For the drive-in application, a stereo signal was not necessary since the sound from the projectors is monaural. In addition, it was found that the range for acceptable signal reception was better and less noisy when set for a mono signal, and easier to tune on digital tuners.

Holes were drilled in the plastic case for easy access to all tuning points without having to open the case. The 9V battery connector was run to the outside of the case, for simple battery changeout by non-technical operators.

Even though the FM-10 runs extremely well on an AC adapter, we decided to go with a 9V battery. The projectors and the sound system are run off of a generator and this provides somewhat less than an ideal voltage profile over the course of an evening. Despite the fact that the FM-10 does not utilize a crystal oscillator, it is remarkably stable in frequency as long as its 9V power source is constant. We found this to be true even though the temperature of the night air drops several degrees after the sun sets.

Many car FM receivers are digitally tuned nowadays and will not tolerate an off-frequency signal. A portable Sangean ATS-830A receiver



The City of Huntsville Park and Recreation's summer drive-in movies add a new dimension ... FM broadcasting of the movie audio.

(which is digitally tuned) is used to ensure that the transmitter is precisely on frequency each week, providing an easy-to-tune signal for digital and analog receivers alike. We discovered that solid reception even on digital radios requires no retuning of the FM-10 from week to week, as long as a new battery is used each night.

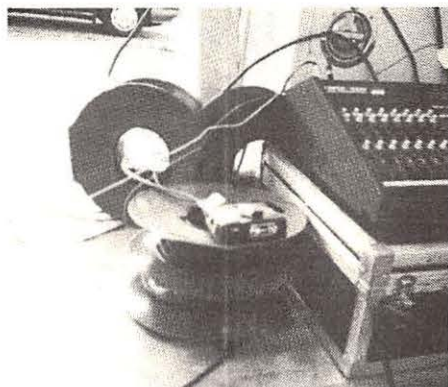
Legal Considerations

The FCC's rules are becoming progressively less restrictive, giving experimenters more and more flexibility in using systems like the one described. Part 15 of the FCC Rules covers these kinds of non-licensed transmissions. The main thing one must observe in using a device like the FM-10 is to make absolutely sure no interference impacts any listener of FCC licensed broadcasts. This even includes local FM broadcast "DXers" set up to receive nearby cities.

Ramsey emphasizes in the manual that the user should go to every extreme to assure that interference to licensed broadcasters does not occur. If interference is reported, operation should cease immediately and proper steps to correct the problem should be taken before resuming transmissions.

Frequency Selection

I took the interference issue to heart, since a violation (even an unintentional one) of any FCC rule could potentially cost me my amateur license. I consider my "ham" license one of my most prized possessions, so great diligence was exercised in



Don't let the small size and low price of the Ramsey FM-10 transmitter mislead you; it is a well designed, quality product.

selecting a transmitting frequency. First, I consulted *White's Radio Log* to determine a frequency which was not used by any FM broadcaster within receiving distance of Huntsville. A tentative frequency was selected on this basis.

Next, I checked out *White's Log* to ensure that broadcast channels on either side of the frequency were clear in nearby cities. I found that the nearest stations on these frequencies were at least 75 miles away and protected by the semicircle of hills surrounding the drive-in. Only apartment buildings and commercial establishments lie in the direction not protected by the hills. Since no external FM antennas were observed on these buildings, I felt it was unlikely that any serious radio enthusiasts could be adversely affected.

As a final test, I took the Sangean to the site of the drive-in and carefully tuned around these frequencies. I was unable to receive any stations at the site within 200 kHz of the selected frequency.

External Antennas

To assure a quality signal to every vehicle attending, it was determined that an external antenna must be used on the transmitter. A simple ground plane antenna was constructed based on a design in the *ARRL Handbook for the Radio Amateur*, incorporating welding rods attached to an SO-239 connector. The antenna was fed by twenty feet of low-loss RG-8X coax to allow flexibility in placing the antenna.

The ground plane worked extremely well at the first two movies. One of our movie-goers reported a clear signal down the street as he exited the drive-in. The ground plane, however, was not rugged enough to withstand rough handling by volunteers. The antenna was broken after the very first use while being transported. Following a quick field repair, it performed for a second evening.

I took on a personal challenge to build an antenna that could not be destroyed by harsh handling. I thought of "shortening" a CB magnet mount antenna to the proper frequency, but found that the top of the portable "stage" was fiberglass, not metal. This would not provide secure mounting for the magnet, nor a good electrical counterpoise

for the antenna. I finally decided on an inexpensive "J-pole" design made of 300 ohm TV twinlead described in the April 1982 issue of *QST* magazine.

I built the antenna to withstand anything short of nuclear attack by applying plenty of RTV and enough black electrical tape to make it virtually indestructible. That J-pole even rolls up in a compact package for easy storage. As a bonus, the J-pole provides significant gain over a ground plane, placing more of the signal near the ground (where the cars are) and away from the sky (where the cars aren't).

The Results

Music and announcements are played through both the loudspeaker and the FM broadcast systems starting about an hour before each movie begins. Directions on where to tune are given periodically as part of the announcements. This allows viewers plenty of time to set their car radios for the movie audio. As a result, many movie-goers took advantage of the broadcast. We received many compliments on the system, as record crowds attended all summer long.

People even brought out portable radios to improve the sound in lawnchairs, pick-up truck beds, and in one case, a large sofa containing a dozen or so college kids. One movie, Walt Disney's *Beauty and the Beast*, drew around 2000 people. After the parking lot was filled to capacity, cars were sent across the street to a shopping center and occupants were asked to come over to the drive-in on foot for free admission.

I'd like to think that the FM broadcasting of the movie sound contributed at least in part to the huge success of last summer's Tuesday drive-in movies. I got a lot of pleasure out of applying some of the things I'd learned over the years from the radio hobby for the enjoyment of others in the community who have yet to discover it. Maybe some new radio monitoring enthusiasts and ham operators will result from this exposure to radio transmitting.

I'm still looking for that QSL card request from an FM "DXer" far, far away (like maybe three blocks). And I got one more thing in the deal...I drove a hard bargain with the city...my family and I now have free lifetime passes to the summer drive-in movies!

*M*_T



A close-up of the J-pole (left) and the damaged ground plane, displayed by Carol, N4QPE.

For More Information

- 1) Ramsey Model No. FM-10 FM Stereo Transmitter. Ramsey Electronics, Inc., 793 Canning Parkway, Victor, NY 14564; phone (716)924-4560.
- 2) *The 1987 ARRL Handbook for the Radio Amateur*. American Radio Relay League, Inc., 225 Main Street, Newington, CT 06111; phone (203)666-1541.
- 3) *QST*. Published by the American Radio Relay League, Inc.
- 4) *White's Radio Log*, Volume 1, Number 1. Published by Worldwide Publications Inc., P.O. Box 5206, North Branch, NJ, 08876.

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*asterisk before/after time signifies station sign-on/sign-off;

// means parallel; + means continuing but not monitored;

= 2 x indicates 2nd harmonic of following frequency.

AFGHANISTAN R. Afghanistan resumed S. Asian service on 7200, sometimes called "9635," 1430 English, 1500 Urdu, 1530-1730 domestic relay (BBC Monitoring)

ALGERIA RTVA English at 1900-2000 on 11715.13, claiming "15205," also 9535, 17745.2v; 11715 blocked by China-Mali after 1930 (Brian Alexander, PA, *DX Daily*) Also at 1600-1700 on 15160, 11715 (RVI *Radio World* via Steven Cline)

ANGOLA VORGAN, UNITA station, 0445-0845 on 9700, 6045, 1045-1440 on 11830, 7290, 1630-2345 on 7100, 6035; English irregular 2125-2150, French 2150-2215 (BBCM)

AUSTRALIA Australian Armed Forces Radio also has unpublicized SSB service, family messages until about 1300 on 12070.5 (Gigi Lytle, TX & gh) Times vary widely, as early as 1151, as late as 1800 also on 13508.5 USB, sometimes both at once (Ed LaCrosse, CA, *DX Daily*)

AZERBAIJAN VOA, Baku, now on 15240 for 1700-1800 English, but now QRMoscow (RVI and Wolfgang Büschel, B. Alexander)

BANGLADESH R. Bang, in English at 1230 is strong but under-modulated and buzzy on 11708, 13620 (Craig Seager, *Australian DX News*)

BOLIVIA New on SW, to promote owner's presidential campaign, elections June 6, is R. La Integración, El Alto, La Paz, 6122.9. R. Metropolitana, 6195 is active for same reason (Henrik Klemetz, Colombia) 6122.8 station opens at 1000, covered by Uruguay around 1015. Also new is R. Emisora Entre Ríos, O'Connor Province, Tarija Dept., 4630.7 from 0000 or 0030 (Emilio Pedro Povrzenic, Argentina, *DX Daily*) unID on 4903.8 until 0042*, perhaps from here called R. La Palabra (Klemetz, *Play-DX*)

BRAZIL R. Anhanguera, 11830, 0157-0213* abrupt, had full ID on the hour, weak but clear (Paul Brouillette, IL, *DX Daily*) R. Educadora da Bahia reactivated on 6019.9 at 2300 April 26 (Hans Johnson, MD, *DX Daily*)

BULGARIA R. Bulgaria, 0300-0400 9850 11765, 1030-1200 13670, 17830, 17860, 1730-1900 11720 13670, 2000-2100, 2145-2315, 0000-0100 11720 15330 (RVI *Radio World*)

CANADA RCI's revamped schedule leaves less time for CBC programs—*Quirks & Quarks*, *Royal Canadian Air Force* are gone from SW. RCI has resumed its own *Mailbag*, but at the outset only brief excerpts of letters, no real dialog and lots of music fill. Sun. 2100, 2230, Mon. 0130 approx. (gh) *Spectrum* occupies the weekday 2030 and 0100 hours; Saturdays, *Innovation Canada*, *Earth Watch*; Sundays, *Arts in Canada*, *Mailbag*. CBC shows: *As It Happens*, weekdays 2230-2400; *Inside Track* Sat. 2300, Sun. 0200; *Open House* Sun. 2300, Mon. 0200 (via Bill Westenhaver and E.D. Cronin) Forces service weekdays moved to 0500-0530 (Westenhaver)

CHINA Gansu PBS, Lanzhou, on 6155, 6005, 4865 at 0230-0630, 0850-1600, 2155-0130 including foreign language lessons 30 min. at 0510, 1400, 0100 (BBCM) Perhaps this summer CRI really is on 15210 at 1200, as announced and published all winter while it was really on 9655, but May 3 still on 9655, and on 7405 at 1400, 1500 (*DX Daily*)

COLOMBIA If you hear unusual music on 9655, don't jump to conclusions. Rdif. Nacional *Música y Tierra* program one Sunday at 2214-2235 was playing Balinese gamelan (Paul Brouillette, IL, *DX Daily*) 9655 is a new 20 kW Thomson-Houston, // 17865v an old 5 kW Siemens, both located at El Rosal, Subachoque, 50 km N, of Bogotá, 1750-0400 or 0430 with program separate from AM & FM (Henrik Klemetz, Colombia, *WRTH LA Newsletter* via *Play-DX*) Ecos del Pueblo, 5531.1v, Sapuyes, Nariño, as late as 0100 only on UT Mon.; Ondas del Puerto, 4627, La Virginia, Risaralda, heard after 2300, harmonic of a pirate on 1156.8 (Klemetz, *SW Bulletin*) La Voz de los Cedros, Libano, Tolima, on 3139.6 until 0236*, announced nom. 1510 (Klemetz) R. Patria Libre, clandestine, *0038 on 5840 announced as 0030 on 5750, also 1130 near 6300; heard at 1127-1157 on 6270 repeating the 0030 (BBCM)

COMOROS Active again on 3330 until 2101* in March (Roland Schulze, Germany, *Fine Tuning*)

COSTA RICA With superpower monsters WEWN 7425 and VOA 7405 both on after 0000, mix overloads some receivers on 7385, blocking RFPI, but it switched to USB on 7375. Planned to rebuild self-supporting tower to first level 24 meters, put 15/21 MHz-band cubical quad on it, greatly increasing gain on 15030, 21465; log-periodic for 7 MHz on new guyed tower 48m up also makes stronger signal now, expected to be best ever, especially with new 30 kW transmitter (RFPI *Mailbags*) *World of Radio* remains scheduled: Fri. 2000, Sat. 0400, 1200, 1800, Sun. 0200, 1000, 2300, Mon. 0700, Tue. 1900, Wed. 0300, 1100. *New Dimensions Radio*, Mon. 2230, Wed. 1930, Fri. & Sun. 1900 plus repeats: week of May 31, The Co-Creative Adventure with Barbara Marx Hubbard; June 7, Singer in the Real World—Holly Near; June 14, Advocacy for Prisoners; June 21, The New Male; June 28, Images of the Black Madonna (VISTA)

Spain's Carriari relay announced schedule: Mon.-Fri. 1100-1400 on 15125, 5970, 11880, 1800-2400 on 17870, 9745, 17890; Mn.-Sat. 0100-0400 on 5970, Tue.-Sat. 0100-0400 on 11815, 9630; Sat. & Sun. 1400-0100 on 17870, 9745, 17890, the last starting at 1300. Frequency order in each group is S., C., N. America; now includes *Amigos de la Onda Corta*, DX program whence this was copied, UT Suns. 0035-0055, right after the bullfighting show (*DX Daily*)

CROATIA Zagreb audible most of day and night on 13830, also 9830 and 6145 in darkness, the latter causing DW problems; wonderful music. English news shifted an hour earlier to 2103-2110 or 2115, probably the same for other timings. Previous news for UN forces at 2030 not heard then or at 1930 (Tom Sundstrom, NJ, *DX Daily*)

CUBA RHC at 2100-2200 on 17760 ex-15165 (George Thurman, IL) Replacing 9655 with 13660 AM at 0200-0430, 6010 may go up to 9 MHz (Arnie Coro, *DXers Unlimited*) [non] Thanks to tip from Tim Hendel on W.O.R., La Voz del CID heard at 0550-0645 on 9458.49, my first sesqui-harmonic, of 6305.66 (Brian Alexander, PA, *DX Daily*)

CYPRUS CBC in Greek to UK 2215-2245 on 9770, 7205, 6180 (Bill Westenhaver, PQ, *DX Daily*)

CZECHIA R. Prague at 0000 moved to 9485 because of Serbia 9580, also 7345, 11990 (Wolfgang Büschel, Germany, *DX Daily*) Also 9485 at 0100, 0300 (Westenhaver, *ibid.*) New 7300 at 2000, delayed behind // 7345 (Tom Sundstrom, NJ, *SWL-List* via Will Martin) 9490 ex-9605 at 1700 (Büschel, *DX Daily*)

ECUADOR Harmonics logged: 4720.3, R. Cuenca at 1030, 4 x 1180; 6201.2, R. Sonorama, Riobamba, at 2350, 5 x 1240; 6440, HCJB at 1100, 2 x 3220 (Henrik Klemetz, Colombia, *Play-DX*) R. Unión Calvense, Cariamanga on 3020, at 0045-0120, 2 x 1510 (Yimber H. Gaviria, *ibid.*) HCJB at 0700-0830 to Europe resumed 6205 // 11835, ex-15270 (Brian Alexander, PA, *DX Daily*) Replacing *Happiness Is* on Thursdays is *What's Cooking in the Andes* (*DX Partyline*) Such as UT Friday 0100, 0300, 0530 (gh) V. del Upano seems to have taken over R. Río Amazonas on 4870, // 5040 (Henrik Klemetz, Colombia, *DX Daily*)

EGYPT R. Cairo, 9475 programs "to July" include: *Life in Egypt*, UT Mon. 0235; *Listeners Mail*, Mon. and Wed. 0245; *Lighter Side of the News*, Tue. 0235; *Galleries & Exhibitions*, Tue. 0300; *Tourism in Egypt*, Wed. 0235; *Letter from Egypt*, Wed. 0305; *Ancient Egyptian Civilisation*, Thu. 0235; *Cairo Magazine*, Fri. 0255; *American in Egypt*, Sat. 0305; *Stamp Collectors Club*, Sun. 0305 (via John Figliozzi)

ERITREA V. of the Broad Masses of Eritrea has split into two separate services—both open daily at 0330, starting in Afar on 7020, 5000; in Kunama on 7380, 3940; and both close at 1700 (BBCM)

EURO-PIRATES R. Piraña International planned to test June 20

at 1500 or 1600 on 21590 or 21780 LSB, and at 2100 or 2200 on 13950 (Andrew Yoder, A*C*E) The day before an April test from this, heard on 21590 LSB at 1244-1311, 1450, IDs for R. G'Day (Gigi Lytle, TX) R. Caroline, 6249.89, 0715-0755 in early April, weak (Brian Alexander, PA, *DX Daily*)

FINLAND YLE R. Finland weekdays 1130, 1230, 1330, Sat. 1230 and 1330, Sun. 1300 on 15400, 11900; daily 0145 on 11755, 15185 (R. Finland 800 number) Expanded to 30 minutes each (Charles Horowitz, OH, *DX Daily*) Only weekday program title published is now *Compass North* (via Gigi Lytle) I still heard a 5-minute *Air Mail*, Mon. at 1249 (gh, NM)

FLANDERS RVI at 1300 except Sundays 1130 on 15540 ex-15530 (Paul Brems, Belgium, Fidonet *SW Echo* via George Thurman) Wrong way, moving into Moscow interference (gh)

FRANCE RFI at 2055-2153 on 12350 = 2 x 6175 (Ed Rausch, NJ)

GEORGIA R. Georgia announced toward Munich on 11910 at 0800-0930, 1500-1630; Oslo on 11910 at 0500-0630, 11760 at 1700-1830; Tel Aviv on 11910 at 0700-0800, 9565 at 1900-2000; English at 0530, 0730, 0830, 1530, 1700, 1930 (RVI *Radio World* via Büschel and Steve Cline) V. of Abkhazia, "Apsua Radio" at 1730-1800 on 7305 (BBCM)

GERMANY DW will decrease from 40 to 26 languages due to financial and technical reasons, increase German blocks from 4 to 8 hours each (AP via Büschel) Best program on SW for learning a language is *German, Why Not* on DW; free lesson books (Kevin Gooch, MO) Saturdays

GREECE VOG retimed one morning broadcast, 1335-1345 daily on 15635, 17515 (John Babbis, MD)

GUYANA GBS reactivated on 5950 at 1030 (Hans Johnson, MD)

HAITI [non] R. 16 Désanm, via R. Miami International on WHRI weekdays at 12 switched to 1700-1800 on 15105 for better reception (RMI)

HAWAII Timetable for KWHR, 8 miles from southern tip of Big Island; June 15, ship transmitter; June-July, construct building; July-August, install transmitter; late Sept. or early Oct., target date for on air; programs fed by satellite from South Bend on TV subcarriers also to be used to feed WHRI (Doug Garlinger, LeSea, R. Netherlands *Media Network*)

HUNGARY R. Budapest at 2100-2200 daily on 11910, 9835, 6110; 0200-0300 on same Sundays, 15220, 11910, 9835 other days. Some specific programs: Thu. May 27, *Money Monthly, To the Folks Back Home*. Sat. May 29, *No Enemy Image, Clubland Music*. Mon. May 31, *Clubland Music*—Israel. Thu. June 3, *Clearing the Air*—expanding public transport. Tue. June 8, *The Floor is Theirs*—stock exchanges. Thu. June 10, *Central Europe Initiative, Coming to Hungary?* Fri. June 11, *Summer at the Merlin*—English theatre season. Mon. June 14, *Starmakers*. Wed. June 16, *Classics*—Jozsef Szigeti. Thu. June 17, *For a Safer World*—communications. Fri. June 18, *Charity Princess*. Tue. June 22, *Graduation Style*. Fri. June 25, *Broughaha*. Mon. June 28, *The Kid at the Operetta*. Tue. June 29, *The Quality Tourist*. Wed. June 30, *They Spoke Out on Discrimination*. Many are repeated following Sat. or Sun. (via John Carson)

INDIA AIR on 15075 ex-15080 for English at 1745 (Joe Barry, OR) Also Swahili and Indian languages at other times, but this still listed in April on 15080 (*India Calling* via Kevin Klein) AIR added new domestic news in English for NRIs—non-resident Indians, 1530-1545 on 11670, 10330, 9910, 7412, 7140 (BBCM)

INDONESIA RRI Padang, 4003, has English Mondays only at 1430-1500 (Atsunori Ishida, Japan, via Tsutomu Kito, *OzDX*)

INTERNATIONAL WATERS [& non] Brother Stair, formerly on WHRI and WWCR, still on WRNO, planned to add KVOH, WJCR and King of Hope, Lebanon from May, and has bought a ship in Boston to be painted and equipped with four 10 kW SW transmitters for \$20,000 (via Diane Maurer, Ernie Behr, Frank Orcutt, *World of Radio*) So the world did not end in April? Stair backed the Branch Davidians.

IRAN [non] V. of Human Rights & Freedom of Iran an hour earlier on 9350, 0228-0422, opening in English, mixing with WCSN until it closed at 0356, // 11471.17 drifting up to 11472.5 (Brian Alexander, PA, *DX Daily*)

IRAQ RII on 11809.96 from 2045 to 2257*, mostly in English 2057-2244, good level, but poor, muddy audio (Brian Alexander, PA, *DX Daily*)

ISRAEL Kol Israel's Sunday-Thursday 1300, daily 1900 and 2130

are all on 11587, 11603, 15640, 15650, 17575. Some programs: *Postmark*—stamps, Thu. 19, Sun. 13 & 2130. *Calling All Listeners & DX Corner*, Sun. 19, Mon. 13 & 2130. *This Land*—travel, Wed. 10 & 19, Thu. 13 & 2130. *Letter from Jerusalem*, Fri. 10, 19, 2130 (via Will Martin, George Thurman, Dave Jeffery)

JAPAN R. Japan made a last minute change putting *Media Roundup* back on relays allowing easy audibility: UT Sun. 0530 on 9725, 1430 on 11735, and direct on 11865, 1730 on 11865, 2130 on 11925, Mon. 0130 on 5960 (via Joel Rubin, Tom Sundstrom, John Norfolk) *Hello from Tokyo*, mailbag now Sun. 0315, 0615, 0715, 0915, 1115, 1515, 1915, 2315. Same transmissions as *Media Roundup* at :15 past the hour other days: Mon. & Wed., *Spectrum*; Tue., *Enjoy Japanese*; Thu., *The Travel & Book Beat*; Fri., *Music Mix*; Sat., *This Week* (via Gigi Lytle) June topic of listener essays on *Crosscurrents*, Thursdays during the "Hello" set of airings, is Culture and Traditions to Protect and Pass On (via Gigi Lytle)

KOREA NORTH If the U.S. thinks it can make the Korean people waver with a yellow wind, it is a great mistake and delusion (KCNA on plans for R. Free Asia, via BBCM)

KOREA SOUTH R. Korea shifted from 0030 to 0100 on 15575; adds 1200 on 9640 then relays BBC English at 1300-1400; half-hour R. Korea in English at 1300 on 9570, 13670 (*SW Feedback*) Cancelled 1215 to N. America on 9750, but 1200 on 9640 is better (gh) Government is considering lifting ban on S. Koreans owning SW radios before yearend (BBCM)

KURDISTAN V. of Iranian Kordestan, at 1730 on 4640.4, hopping around to 4660.3, 4649.8, // 3945.3 (Finn Krone, Denmark, *SW Bulletin*)

KUWAIT R. Kuwait, 13620 at 1800-2100 is mostly music; news 1830; *Testimony of History* at 2000-2015, *Kuwait and the Media* 2030-2045, both seven days a week (via Steve Hunter, PA, *DX Daily*)

LIBERIA ELWA, revived on FM, has immediate plans for a 20 kW SW in Monrovia, and similar transmitters in one or two other W. African countries (SIM head on HCJB *DX Partyline*)

MONACO TWR has lovely Persian folk music, Sundays 1543-1613 on 12080 (Büschel, *DX Daily*)

MOZAMBIQUE Maputo on 11817.4v at 0508-0513, usually but not always // 15293.9 (Mikhail P. Timofeyev, Russia, *DSWCI SW News*)

NETHERLANDS ANTILLES Remember, TWR closes SW here July 1; special QSLs for the last few days in June.

NEW ZEALAND It got off to a shaky start, but *Presenting the Pacific*, Tues. 0505-0600 on 15120, in April broadcast programs about these islands produced by their stations: Tonga, Fiji, Kiribati. If adhering to its 4-week pattern, *Around the World with Rudi Hill* should be back Tue. June 15 at 0930 on 9700, Fri. June 18 at 0430 on 15120 (gh) Those two frequencies remain best for us, switching at 0658, but for southern winter, lower ones elsewhere—6035 at 1650-1849, 11735 at 1850-2136.

NIGERIA No QSL? 646 bags of mail from various countries stolen so far this year. Several countries complained to Nigerian government, and Italy suspended service (Chamel Africa via Bruce MacGibbon, R. Japan *MR*)

NORWAY RNI changed sked given last month before it could go into effect: Sun. 2300 on 11795, 9655; Mon. 0000 on 9675, 0100 on 9560, 0200 on 9560, 11925, 0300 & 0400 on 9560, 11865; best on 9655, 9675 and at 0100 on 9560 (Bob Thomas, CT, *DX Daily*)

PALAU KHBN, 9830 at 0800-1530 & 2000-0100, made changes:

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— Much more info in the style of Hauser's column.

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Glenn Hauser, Box 1684-MT, Enid, OK 73702

Persian daily 1445-1500; Std. Chinese daily 0800-0900, 0930-1130, 2000-2030, 2230-2330, Mon.-Sat. 1130-1200, Sat. & Sun. 0900-0930; Vietnamese daily 1430-1445, Sun. 1130-1200, 1400-1430; Korean, Mon.-Fri. 1400-1430 (Mike Fern, High Adventure Ministries, *DX Daily*) but some days heard in Spanish from 1400 (Ernie Behr, Ont., *ibid.*) or English (gh)

PERU R. Ritmo, probably in Puerto Maldonado, 5602.7 at 1048 and 2300, also with R. Programas del Perú satellite programming. R. Reina de la Selva, Chachapoyas, 5486.6 until 0030 or 0100, reactivated, ex-3464. R. Atorongo (?), Maipuco, Loreto, 4107-4108v heard only once; R. Frecuencia VH, La Voz de Celendín, 4485.1 at 1120-0520 (Henrik Klemetz, Colombia, *SW Bulletin* and *LA Newsletter*) R. Paucartambo, in Paucartambo, Pasco, new on 4510v, 0120-0200 (Takayuki Inoue N., Bolivia, *Relámpago DX* via *Radio Nuevo Mundo*) R. Ilucán, 5619.3v to 5620.5, listed as 100 watts, UT Mons. only 0000-0200, heard with comunicados (Santiago San Gil, Venezuela, *DX Daily*) R. Universo, 6815.3 at 0130 is from Saposoa, not Pandalle (Henrik Klemetz, *Play-DX*) R. Universal, Cusco now on 6095.2, *1030...2400* (Klemetz, *DX Daily*)

PORTUGAL R. Portugal again moved English one hour earlier this year, and maybe it will stick this time—0130 weeknights on 9570, 9705 (Bill Westenhaver, PQ) Also 1430 ex-1530 on 21515 (AMID via Büschel, *DX Daily*)

RUSSIA AWR, Novosibirsk, 200 kW for Z-93, 0100-1600 11835, 1700-2400 9835, including English hours at 0200, 0700, 1200, 1900 (Adrian Peterson, IN) Aren't they supposed to be cooperating now? Around 2130, both VOA and Moscow in English on 15580 (gh, NM) R. Galaxy, 11880 at 2010-2100, mostly music with English announcements, saying schedule is 1900-2100 (Brian Alexander, PA, *DX Daily*) R. Nadezhda, 1500-1800 on 6110, 7235, 9490, 9580, 17675, 2100-2300 on 5905, 12015 (Igor Sannikov, *Play-DX*) R. Vedo expanded to daily 0500-0800 on 5915, 7125, 1400-1830 on 7185, 9655, 11760, 13710 (Yoshinori Kato, RJMR) Amur R. resumed SW after ten years, 9500 at 1900-1700. R. Stn. Alpha & Omega doubled time to 1300-1500 on 9865 (Shigenori Aoki & Y. Kato, RJMR)

SAHARA [non?] On 11520 at 2033-2400* Arabic, V. of the Homeland from the Arab Sahara Democratic Republic, from here or just another Algiers production? (Bob Hill, MA, *W.O.R.*) It's National Radio of the SADR, 11520, 1700-2400, also on MW 1544 ex-1355 (BBCM)

SA'UDI ARABIA BSKSA feeder in Arabic at 1612 on 10990 (Zdenek Elias, Czechia, World DX Club Contact)

SERBIA R. Yugoslavia, English an hour earlier at 2100, very good on 9505 (Brian Alexander, PA, *DX Daily*)

SLOVAKIA RSI in English: 0830 on 21705, 17535, 15605, 11990; 1830 on 9605, 7345, 5915; 0100 on 9810, 7310, 5930 (BBCM)

SOMALIA International Amateur Radio Network announced "broad agreements" with government of Somalia to establish R. Free Somalia on SW, plus ham radio (John Norfolk, OK, *W.O.R.*)

SPAIN RNE R. Uno domestic service on 11430 at 1030-1100+ on a Sunday (John Mattocks, England, BDXC *Communication*) 9370 and 10010, mixing products of Spanish on 9530 and China relay on 9690 at 0300-0400 (Brian Alexander, PA, *DX Daily*) After the *DX Spot* on Saturdays is *Spain Speaking*, interviews, UT Sundays around 0015, 0115, 0515 on 9530. Thanks to Terry Burgoyne for mentioning and quoting *MT* on *DX Spot*. [See also COSTA RICA]

SURINAM R. Apintie, 5005, planned to relay R. Nederland mornings in Dutch from early June (RNMN) in late April heard on 4990.9 instead around 2300 (Hans Johnson, MD, *DX Daily*)

SVALBARD Coastal stations will relay news from NRK Norway, on 1731 kHz USB, at 0700, 1500, 1900, perhaps joined later by Jan Mayen (*DX News* via Risto Kotlampi's *Euronews* via *SWL-List* via Will Martin) So do we have a new SWBC country?

SWEDEN R. Sweden set up special service to Swedish forces in Balkans, domestic program one relay at 0500-1600 on 9695 (*Mediascan*)

TANZANIA On at least two occasions, 5000 instead of 5050 at 0337-0400 (Roland Schulze, Germany, DSWCI *SW News*) I suppose, punch-up errors (gh)

THAILAND VOA Udon tests changed for Z-93 to: 1100-1300 on 11820, 1300-1400 on 11875, 1400-1600 on 9590, 1600-1700 on 9615, 2100-

2300 on 6045, all in Chinese (Mark Meece, Miami Valley DX Club)

UAE Abu Dhabi, English from 2159 on 9770, 11710, 11885 Brian Alexander, PA, *DX Daily*)

UKOGBANI R. Korea relay via Skelton has English at 2030-2100 on 6035 (*SW Feedback*) *Brain of Britain*, BBC's terrific quiz show is back for a new season all summer, Sun. 2030, Mon. 1215, Tue. 0230.

UKRAINE RUI at 0000-0100 now on 6070 covered by CFRX, 6090, 7240 with hams complaining, 9550, 9640, 15195, 15580 (Bob Thomas, CT, *DX Daily*) Also on 9685, 9860 which create numerous intermittent spurs, some strong—8635, 8810, 8985, 9160, 9335, 9510, 10035, 10210, 10385, 10560, 10735; also during Ukrainian at 0200 (Alexander, PA, *ibid.*)

USA *DX Daily* on R. Miami International via WHRI simplified to UT Tue.-Sat. 0130 on 7315, 0600 on 7315, 9495. WHRI also added *World of Radio*, UT Sat. 0030 & Mon. 0300 (or 0200) on 7315; *For the People*, weekdays 1800-2000 on 17830, 0300-0500 on 7315, Sat. 1500-1700 on 9465, 15105. And WHRI broadcasts the Indy 500 live May 30. *World of Radio* continues on WRNO, Sat. & Sun. 2030 on 15420, UT Sun. 0200 on 7355; see also COSTA RICA.

God started the fire at WWCR for censoring him, says Brother Stair, The Overcomer (J.J. Hitt, FIDONET *SW Echo* via George Thurman) On a *World of Radio* interview, WWCR manager George McClintock described in great detail how investigators had determined the fire started outside the back of the building, and spread undetected for some time between roof and drop ceiling; he concluded it was deliberately set by opponents of free speech (gh) Fire Department arson investigators feel it was not arson, but poor housekeeping, overloaded electrical systems (Blake Bowers, Nashville, *SW Echo* via Thurman) Continental transmitters are replacing the burned-up Harris units, the first one arriving April 29; check previous WWCR frequencies for reactivation—5935, 7435, 12160, 13845, 15685. WHRI, WRNO, WSHB and even WINB approached WWCR clients in need of a substitute, with varying degrees of success. *Hour of the Time* went on WRNO, 7395, Tue.-Sat. 0500 (gh)

KCBI Dallas, normally 100% Dr. Gene Scott, heard one day at 2010 on 15375 with some other preacher. Later moved to 13720 from 0300 to 0700 or 0800, then 9815; and 15725 may expand daytimes to replace 15375, the latter a frequency of numerological significance to DGS (George Thurman) WRMI Miami may be active now on 9955; reports welcome via fax to 305-267-9253. *Miami en Vivo* on 7355 moved to Sun. 2330 (Jeff White) KJES Vado disappeared again after we heard it April 7; Michael Reuter tells us due to a short between antenna and rotor, back on May 3 with previous daily schedule (gh) VOA Somali 0245-0300 keeps changing, but started Z-93 on 6125, 7125, 7265, 7405, 9885 (*SWL List* via Will Martin) One UT Sunday, AFRTS heard from 0130 to 0735 on 11400 USB (Brian Alexander, PA, *DX Daily*) Probably UKOGBANI relay. Another station to look for on 11 meters—KGON, 92.3, Portland, OR, planned a test on 25950 one Saturday at 1700 (Chuck Albertson, Seattle, *DX Daily*) WFLA, Tampa, still often heard on 25870 FM (gh, NM)

During the NAB convention in Las Vegas, NV, KDAB demonstrated compatible digital/analog broadcasting on 1660 kHz, 24 hours, using standby facility of KENO (Steve Schmidt, AZ) Also heard here! *DX Daily* listeners found out about it in time to try for it themselves (gh)

UZBEKISTAN R. Tashkent at 1200 & 1330 replaced 15470 by 15295, // 7325, 9715, 17745 (RVI Radio World via Büschel)

VENEZUELA Acción Democrática, the ruling party, took full control of my former station, R. Nacional, at the beginning of April. Newscasts are party-slanted. Opposition parties cannot be mentioned at all—absurd, since Venezuela is currently in an election year. Management was purged, and SW may be abolished. I left in October after I was offered a job with the San Juan *Star* in Puerto Rico. For several months, the SW service was off the air. However, the staff wasn't aware of this, and continued to prepare its daily programming. It's a shameful situation since we tried to make RNV one of the more popular stations in South America. I don't discard going back once the political situation is clear (Marty Delfin, PR) See Marty's profile of RNV, Aug. '92 (R. Baughn)

Until the next, best of DX and 73 de Glenn!

Broadcast Loggings

Thanks to our contributors — Have you sent in YOUR logs?
Send to **Gayle Van Horn**, c/o Monitoring Times.
English broadcast unless otherwise noted.

0025 UTC on 6010

CUBA: Radio Havana. *Spotlight on the Americas*. (Bob Fraser, Cohasset, MA) 0130 on 6010 kHz *Breakthrough* program. Station heard 0200-0400 on 6010/9655 kHz/0430-500 on 6010/6180 kHz. (Thomas Banks, Dallas, TX)

0030 UTC on 5975

CANADA: BBC relay. Vintage comedy show *Much Binding in the Marsh*. Radio Japan's Canadian relay heard on 6120 kHz at 1140. (Fraser, MA)

0108 UTC on 5850

UNITED STATES: WSHB. Christian programming to ID and *Science Sentinel* feature. (Banks, TX) Dallas' KCBI heard on 9815 kHz at 0615-0700 UTC with Dr. Scott's program. ID at 0700. (Banks, TX)

0126 UTC on 17690

UKRAINE: Radio Ukraine Intl. Folk music to station ID and letterbox show. Additional republics audible; Georgia-Radio Tbilisi on 15235 kHz at 1700 with interval signal, ID, three time tips and anthem. Russia-Chita Radio 4860 kHz at 2201 with English news reports. (Maywoods DX Team, KY) Russia-Radio Moscow *Audio Book Club* on composer Rachmaninoff's lost love. 112050 kHz. (Fraser, MA)

0135 UTC on 6190

PERU: Radio Oriente. Spanish. Peruvian vocals to VOA sign-on at 0145. Peru's Radio Satellite heard on 6724.34 kHz at 0152-0201. (Maywoods DX Team, KY) Additional Peruvians monitored; Radio Chota at 0245-0255* on 4890 kHz, with great huaynos music to sign-off ID. New frequency for Radio Cusco on 6203.5 kHz at 1040. Radio Tacna on 9505 kHz. Local ad jingles and IDs heard to 1030. (Frank Hillton, Charleston, SC)

0200 UTC on 5990

ROMANIA: Radio Romania Intl. News and feature on Romanian culture. Parallel frequencies 6155/9510/9570 kHz. (Hillton, SC) Arabic ID "Hannah Bucuresti" on 17745 kHz at 1530. (Maywoods DX Team, KY)

0220 UTC on 3300

GUATEMALA: Radio Cultural. Religious music and testimony. (Maywoods DX Team, KY) (Stephen Hunter, Drexel Hills, PA) Additional Guatemalan stations audible; La Voz de Nahuala 3360 kHz at 0230/Radio Tezulutlan 3370 kHz at 0239/ Radio Chortis 3380 kHz at 0347/Radio Buenas Nuevas 4800 kHz at 1125/ La Voz del Cid 9942 kHz at 1620. (Maywoods DX Team, KY)

0226 UTC on 3365

BRAZIL: Radio Cultura. Portuguese. Soccer commentary from excited announcer. (Maywoods DX Team members-Ed Shaw, Dr. Joel Roitman, Charles Everman, Wayne Gregory, Eric Petty, Jim McClure, John Hafendorfer, John Long, Michael Matus, and Loy Lee, KY)

0228 UTC on 4770.84

ECUADOR: Centinela del Sur. Spanish. Sportscaster's futbol coverage. Spanish announcement with mentions of Quito. Ecuador's Ecos del Oriente heard on 3269.3 at 0305 with Ecuadorian music. (Maywoods DX Team, KY) Radio Nacional Progreso heard on 5060.5 kHz USB at 1130. Good signal for music and program feature. (Sam Wright, Biloxi, MS) Radio Centro heard on 3289.9 kHz at 0730 with time checks and nice Latin ballads. (Rausch, NJ)

0235 UTC on 9964

CLANDESTINE: Radio Caiman. Spanish. Discussion on Yeltsin to musical intermission. Station ID at 0249 to announcer duo chat. (Mikell Goetsch, Pittsburg, PA) Station heard in Spanish at 1325 on 9941.65/9965 kHz. (Don Taylor, Green Cove Springs, FL)

0301 UTC on 7355

UNITED STATES: La Voz de Unidad Cubana via WRNO. Station ID at tune-in to talk on embargo against Cuba's Castro. (Goetsch, PA)

0313 UTC on 7385

COSTA RICA: RFPI. Four day monitoring session with station noted as: 0313-0400 on 7375/7385/13630/21465 kHz; 0030 on 7375/7385/13630/15030/21465 kHz. (Gerald Brookman, Kenai, AK)

0330 UTC on 14950 USB

RUSSIA: Radio Raqui. Russian. Female announcers with a humorous interview. Music bridge to Russian vocal selection. Choral music at 0354, to time pips and ID. (Jerry Witham, Keauau, HI)

0330 UTC on 11827

FRENCH POLYNESIA: RFO Tahiti. French/Tahitian. Polynesian music to reggae. Announcer's chat and ID to frequency quote. (Ed Rausch, Cedar Grove, NJ) Audible this frequency at 1030. French with loud het on 11825 kHz (Taiwan). Excellent signal. (Larry Van Horn, LA)

0429 UTC on 15125

RUSSIA: AWR Russia. Three signal tones to 0430. Station sign-on as, "This is the Voice of Hope, Adventist World Radio." Fair signal quality with noise and fading increasing by 0440, fadeout by 0445. (GVH)

0500 UTC on 15430

SOUTH AFRICA: Channel Africa. Station ID to, "Good morning West Africa,

it's 5 am" into newscast. Wake-up music with chatter at 0505 into educational program. (Witham, HI) Fair signal on 11745 kHz, 0510-0525. (Hillton, SC)

0527 UTC on 7465

UNITED STATES: WEWN. Catholic rosary in presumed Latin. Station ID to talk and sermonette from Father Ray. (Goetsch, PA)

0535 UTC on 7370

TURKEY: Turkish Police Radio. Turkish. National music and announcer comments. Voice of Turkey monitored on 9445 kHz at 2229 in Turkish, and 2334 on 9445 kHz. (Maywoods DX Team, KY) (Fraser, MA) Turkish folk music at 0405 on 9445 kHz. (Goetsch, PA)

0800 UTC on 7355

UNITED STATES: La Voz de Alpha 66 via WHRI. WHRI sign-on into Spanish ID for Alpha 66. Cuban patriotic music between anti-Castro discussion. La Voz de la Fundacion heard via WHRI at 0959 on 9850 kHz. WHRI ID, into Spanish ID and more anti-Castro talk. Regular WHRI programming monitored on 7315 kHz at 0804-0840. (Goetsch, PA)

0832 UTC on 9580

AUSTRALIA: Radio Australia. Cricket scores to ID at 0843. Chat on exotic food including kangaroo meat! (Goetsch, PA) Magazine show with story on Australian activist court case at 1000 on 9580 kHz. (Fraser, MA)

0905 UTC on 11335

NORTH KOREA: Radio Pyongyang. Usual anti-U.S. commentary. More chat on the DMZ and South Korean Army. Classical music at 0915. (Banks, TX) Station heard 1530 on 9835 kHz. (Maywoods DX Team-KY)

0955 UTC on 3905

PAPUA NEW GUINEA: Radio New Ireland. Pidgin. Regional music to 1000 ID. Brief news and chat. (Patrick Theriot, New Orleans, LA) (Rausch, NJ) PNG's Radio East New Britain on 3385 kHz at 1025. (Rausch, NJ) PNG's Radio Enga on 2410 kHz at 1150 talk and news at 1200. (Bagwell, MO)

0957 UTC on 9830

PALAU: KHBN. Chinese/English. Time notes/pips on the hour at 1000 and 1200. Station ID noted at 1330 by male as, "This is KHBN, the Voice of Hope for all of Asia." 1330-1400 in English; interference from 9835 kHz. (Hardester, NC) Religious format in Chinese at 1210 on 9830 kHz. (GVH)

1000 UTC on 4775

PERU: Radio Tarma. Spanish. Music to "Radio Tarma Mas Popular" promotional. (Rausch, NJ) Additional Peruvians monitored; Radio Horizonte at 1040-1100 on 4501 kHz. (Hardester, NC) Radio Andahuaylas 4840 kHz, *1026-1045. National anthem sign-on to ID, and features. (Wright, MS) (Hillton, SC)

1035 UTC on 11915

UNITED STATES: VOA. Station feature on American rock music. (Van Horn) *Encounter* report on 15410 kHz at 1810. (Fraser; Goetsch; Hillton; Wright)

1137 UTC on 4753

INDONESIA: RRI-Ujung Pandang. Indonesian. Indo music to announcers comments. (Maywoods DX Team-KY) Indo RRI-Ternate heard 1005 on 3345 kHz/RRI-Gorontalo on 3266.5 1250-1252*. (Bagwell, MO)

1157 UTC on 6570

MYANMAR: Defense Forces BC. Asian dialect. American and Asian pops. Signal unstable. Radio Myanmar audible despite BBC, Orient vocals, to time pips signal on 5972.9 kHz at 1158. (Maywoods DX Team, KY)

1345 UTC on 11715

UNITED STATES: KJES. Yaweh scripture readings to 1359. Slight power drop to fair/poor level. Occasional children's chorus. Partial ID at 1429. (Hardester, NC) Yaweh this and Yaweh that to 1500 ID on 11715 kHz. (Maywoods DX Team; Wright)

1515 UTC on 2340

CHINA: Fujian People's BS. English/Chinese language lesson. (Witham, HI) Voice of the Strait heard in Chinese on 7280 kHz at 1200. (Maywoods DX Team, KY) China Radio Int'l heard on 4130 kHz at 1705 with world news and editorials. (Witham, HI) (Goetsch, PA)

1520 UTC on 15335

MOROCCO: RTV-Marocaine. Arabic. News, features and Arabic music. Parallel 15345 kHz to 1540. (Brian Bagwell, St. Louis, MO)

1535 UTC on 15435

LIBYA: Radio Jamahiriya. Arabic. Male/female announcer duo with chat and news format reporting. Arabic music vocals. (Hillton, SC) Arabic ID and music to 1830. (Maywoods DX Team, KY)

2008 UTC on 7465

ISRAEL: Kol Israel. Special program for Purim. (Fraser, MA) Monitored on 7465 kHz at 2232-2300 (Goetsch, PA) Audible during band scan at 2130 on 7465/9435/11587/11603/11675/17575 kHz. (GVH)

2236 UTC on 6205.5

DOMINICAN REP: Radio Estrella. Spanish. Announcements, music. Clear ID with fair signal, utility interference. (Hardester, NC)

2327 UTC on 7416

PIRATE: Radio USA. Fake law firm commercial. Station ID and Wellsville, NY, QSL address. Mr. Blue Sky's invitation for listeners to send in editorials. Radio Free Oz/Voice of Oz heard on 7415.5 kHz at 2352-0038. More fake ads and news to a promo for the Necrophilia Foundation! Pirate Radio Virus heard on 7415 kHz at 0232-0245. ID and promo for HIV QSL card. (Goetsch, PA)

Larry Van Horn
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You Want Beacons? Go Fish!

Those of us who live near the United States coast line (not much longer for this sailor!), now have some new and unique targets to listen for. For years 1.6 - 1.8 MHz was the domain of all sorts of beeps, whistles,

grinding and groaning noises. Nondirectional beacons, navigation signals, and stray AM radio pirates inhabited this portion of the spectrum. But technology marches on and some interesting new signals have settled into this patch of radio land.

It started to come to light in October of 1991. Bob Montgomery, a member of the Longwave Club of America in Levittown, PA, started logging a series of CW signals with callsigns that did not fit the pattern of normal nondirectional beacons. Throughout the winter of '91-92, Bob accumulated quite a few of these mysterious CW signals for his logbook.

It has since been determined that a number of these beacons are used by off-shore fishing boats. As these boats stream nets, long lines and drift nets, attached are small radio buoys that serve to locate the net by direction finding techniques. Several calls to local New Orleans marine shops to try to learn more about these beacons turned up very little information.

Now before you jump on my reference to drift nets — yes, I know there is a United Nations ban on drift nets that started at the beginning of the year. I won't say that any or all of these beacons are associated with drift nets — I'm just repeating what a couple of distributors had to say regarding usage.

Most of these units use preprogrammed ROMs or rotary mechanisms to tap out their CW IDs. The units are preprogrammed by the factory with their IDs, so these are not official callsigns that would be filed with international telecommunications agencies. I confirmed this with a call to the local FCC office. The official I talked to had absolutely no idea what this crazy sailor was talking about.

Based on the CW identifications emitted from these beacons, there appear to be seven types. Since the ROMs are programmed by the factory, we can assume that each manufacturer uses a set pattern to ID their beacons. Here are the patterns we see so far.

- KA + 4 or 5 Numbers
- 8/9W + 3 Numbers
- 1 Letter + 1 Number
- 1 Letter + 2, 3 or 4 Numbers
- 2 Letters + 1, 2 or 3 Numbers
- 5 Letters
- 1 Number + 3 Letters

No power ratings have been determined for these beacons, but according to some of my sources they are quite low in output power. In fact, one salesman was quite surprised that anyone on the mainland could hear any of these buoys at all.

Table 1 is the latest list of fishing beacons that have been recently monitored in the United States.

One of the interesting challenges at this point is to try to match the IDs of the beacons with the manufacturers. Are these beacons in widespread

use? So far, I only have reports from around the United States. Are any of our overseas monitors hearing these beacons?

If anyone has any information on the manufacturers (addresses, etc) or more information on these beacons, Utility World would appreciate your input. Now who will be the first in your neighborhood to QSL one of these little ditties?

RTTY-Decoders or PC?

Our faithful reporter from South Africa, Robert Hall, checks in this month with some thoughts on RTTY decoders versus computer software decoding programs. The opinions expressed here are Robert's, and not necessarily those of MT or myself.

Robert writes:

In recent months I have been researching the pros and cons of buying the Hoka Code 3 PC system, the attraction being its wider range of special modes compared to my Universal M-7000 purpose built decoder. For anyone considering the same path, here are some factors to ponder before taking an expensive jump.

1. The Hoka system was reviewed by Mike Richards in the November 1990 issue of the UK *Shortwave Magazine* (SWM). In the two years since then I have seen no logs directly attributed to the system in any magazine or club publication. I wonder why? The advertising has been pretty heavy and there must be many Hoka owners around the world by now!

2. The Hoka's attraction for me, now that I have a PC, are those "extra" modes that I cannot decode with my current version of the M-7000 (i.e. - Piccolo, Coquelet, TORG, Twinplex and Autospec). But searching through the publications plus several reference books, I can see only three very recent reports of any of these modes: an Australian logging of Piccolo out of Hong Kong, a Canadian logging of French diplomatic comms, and an English logging of Autospec from a North Sea oil rig.

These three could have come out of a Hoka, or they could have come from the purpose built Wavecom 4010 and 4100, the Universal M-8000, or some other decoder. And so we still don't know for sure whether the Hoka can produce exotic modes, or whether Hoka owners can work the system!

3. The suppliers are of huge importance, because if anything goes wrong, chances are that only they will be able to put things right. Moreover, only the supplier can install upgrades, and to do this it is necessary to "de-install" from hard to floppy disk which is then mailed back to supplier (leaving one without a decoding system!). It suggests that a Hoka owner should have great faith in his supplier! There are three main suppliers in Europe and I have been in recent contact with all three.

My first letter and fax went off to Hoka UK, who advertise prominently in the UK *Shortwave Magazine*. A second fax produced some cryptic words handwritten on my own fax. My son then telephoned over 20 times in three weeks with no response except from an answerphone. No joy with Hoka UK!

Now over to Hoka Holland who invented the system: Three faxes produced three prompt replies, none of which was clear (double Dutch?). And so we turned finally to Hoka Germany, who sent back an almost intelligible fax explaining that Hoka Holland was on holiday, Hoka UK had a family problem, and they — Hoka Germany — had only the German instruction manual readily available! So, more problems for the poor old buyer!

Table 1: Fishing Beacons

Freq (kHz)	Morse ID	Freq (kHz)	Morse ID	Freq (kHz)	Morse ID
1612	KA83407	1666	B161/QF85/PT75/9W116	1724	B524/YK33
1614	KA89948	1667	QA83/B212/PT85	1725	QR20/2BFN
1615	KA83348	1668	KA9082	1734	9W184
1621	FM816	1670	QA83	1735	2CGD/2DJN
1623	A354	1672	LH85/8W153	1736	2DJP
1624	9W004	1673	B218/KA8528	1737	2DJQ
1625	8W004	1674	B395/BV80/KA85149/QF89	1738	B538/EX51/3CGK
1626	A357/8W004	1675	A305/A387/B195/B272/B450/B480/ B580/KA83930/L222	1739	A391/9W189
1627	A358/9W307/9W308	1676	A378/B145/B171/B222/B480/B4680/ KA82050/QF89	1740	B540
1629	A359/KA83865	1677	B181/B222/B322/KA83930/8W157	1741	2BFJ
1630	9W211	1678	B224/KA83953/KA85152/QF39	1742	2DJV/9W192
1631	B230/KA90029/8W011/9W211	1679	B324/CB52	1742.5	TR18
1633	B230/GA900/KA90029	1680	B488/B588/TY8/9W833	1743	2BFT
1634	B130/8W111/9W329	1681	B171/B180/B1477	1745	BX46
1635	A216/E111/F366/H181/K454	1683	B128/B178/B188	1746	2DKB
1636	A216/A217/A366/B120	1684	B178/KA90384/8W059	1747	BL16/HA8
1637	A35/A208/A216/B230/I55/9W214	1685	B178	1748	TA84/TR18
1638	A366/KA85033/N773/P209	1686	A334/B231	1750	A349/OQ71/TR59
1639	A216/C101	1689	KA90238	1751	B123
1642	F315/KA85036/R448	1690	B187/KA85165/N3	1752	2CIG
1643	S300	1692	KA90237	1753	CZ39
1648	KA83344	1693	B188	1754	BL14/2CII/2DKH
1650	A381/HM381/KA80052/KA90057/ KA90351/KA90352/Z496	1695	B193/9W116	1755	3DKH/3DKI
1651	B105/B147/B186/D198/KA90351/ KA90352/W449	1696	KA83331	1756	2CIK
1652	B158/KA80057/O272/9W102	1697	KA83331	1757	JC20/2DKS
1653	B005/S325	1699	B2/KAWOJ/KA85174	1758	YK56
1654	E452/KA90253/U38	1700	B193/YX17	1759	MC94
1655	A01/B151/B152/D452/O181/W34/ X448	1701	YX47	1760	CH20/MC94/ML93/YK56/2DKM
1656	KA90356	1702	FU91	1761	MA95/ZA75
1657	9W228	1703	CJ03/KA83914	1762	QL21/2BFZ
1658	O70	1705	KA84013	1763	ZA75
1659	A383/A388/B204/VX66	1708	8W119	1769	PL94/PR84
1660	J3/KA84091/2BJC/9W240	1711	B511/BT16/2DIQ	1770	2BAW
1661	9W250	1713	B513/2BFG	1781	B205
1662	B158/9W252	1714	B514/XK01	1782	S631
1663	A217/KA90079/2W043	1715	GV34/TR7/2BEQ	1788	KA83512/TA45
1664	B158/B209/B459/B490/9W016	1716	2DIV	1790	KA83511/SH39/TA43/TK40
1665	B161/B162/B171/B469/PT75/9W116	1717	2DIW	1791	S539
		1721	B521	1792	TR64
				1795	VE53
				1797	SH30

Now to prices. The Hoka system is not really attractive without the six optional upgrades installed. With these, the price in the UK is £608, in Holland Dfl1810, and in Germany - DM1567. Hoka Holland and Germany do not accept credit cards and do require payment in their own currencies. Added to the Hoka price must be all the other costs to work it: IBM PC clone, stable receiver, good antennas, etc, etc. So, Hoka 3 is not cheap, there is some question if it will work, and more importantly, can one make it work?

As a point of information, there are cheaper and simpler PC RTTY systems than the Hoka Code 3 (around £500 in UK) but these tend to limit reception to basic Baudot, CW, FAX, SITOR and NAVTEX. They include the Comar PC SWL and HF FAX (£178), the Universal M-1000 (\$400 in USA), the AEA PK-232 (\$380), and the MFJ-1278 (\$280).

Top of the range purpose built decoders are the Wavecom 4010/4100 (£1000 upwards in the UK) and the Universal M-8000 (\$1299 in the USA). Universal sells an excellent stand alone cheapie, the M-900 for \$450, or \$550 with video fax option (and no PC worries!).

Eventually, David Ross of the Ontario DX Association did an excellent review of the Hoka Code 3, and both Speedx and the UK SWM have produced more recent reports. These all indicate the system is quite complex and more suited to the 10-40 age crowd than someone over 60! But if any of the European suppliers had answered my fax promptly and clearly, I

would probably be a Hoka owner by now.

I am glad they all bungled, because the system is clearly not for me. For less than half the price, I have acquired a PC WEFAX Satellite system, PC Instanttrack Satellite software, and an ICS Synop 11 RTTY/Meteo Radio Weatherfax System. All is now "go" and in glorious color, and it can tell me when the sun is overhead! But it is really easier to just walk outside the shack!

Thanks for the input, Robert. I must admit that I, too, will soon be in the market for a multi-mode purpose decoder and the jury, as far as I am concerned, is still out. I like the idea of the extra modes the Hoka has to offer but the RF interference really bothers me (and signals, too, I bet).

The US distributor for Hoka is: J&J Enterprises, 4001 Parkway Drive, Bossier City, LA 71112. Phone: 318-683-2518 (8-5 CST) and Fax: 318-747-6456 (24 Hours). The Hoka starts at \$495.00 from J&J and no other details are available on upgrades, etc. I will be contacting J&J and hope to have more details for you very soon.

Well, that does it for this Texas edition of Utility World this month. If plans hold up, I will be in Brasstown for the next edition of this column. I'm looking forward to the phone bill going down for sure! Until next month, best of DX to all and let's check out now what you have been hearing in this month's Utility World logging section.

Utility World

Utility Loggings

Abbreviations used in this column

Aero	Aeronautical	HF	High Frequency
AFB	Air Force Base	ID	Identification
AM	Amplitude Modulation	KCNA	Korean Central News Agency
CAMSPAC	Communication Area Master Station - Pacific	LDOC	Long Distance Operational Control
CANFORCE	Canadian Forces	LSB	Lower Side Band
CAP	Civil Air Patrol	MARS	Military Affiliate Radio System
CCG	Canadian Coast Guard	NO JOY	No Success
CFARS	Canadian Forces Amateur Radio Service	RAF	Royal Air Force
CG	Coast Guard	RTTY	Radio Teletype
CGC	Coast Guard Cutter	SECURITE	Maritime Safety Message
COMSTA	Communications Station	USAF	United States Air Force
CW	Continuous Wave (Morse Code)	USB	Upper Side Band
EAM	Emergency Action Message	USCG	United States Coast Guard
FAA	Federal Aviation Administration	USN	United States Navy
Fax	Facsimile	USNG	United States National Guard
FEMA	Federal Emergency Management Agency	USS	United States Ship
FHWA	Federal Highway Administration		

All frequencies in kilohertz (kHz), all times in UTC. All voice transmissions in English unless otherwise noted.

2010.0 Control, KT & KM in USB net at 0410. Same station may have been active on 13236.5 at 1700. (J.Metcalf-Lancaster, KY)

2670.0 NMY42-USCG Moriches, NY, with USB Notice to Mariners at 0012. NMF-USCG Boston, MA, with North Atlantic marine weather in USB at 1045. NOK-USCG Key West, FL, calling the vessel "Night Flight" in USB, no joy at 1226. NMA21-USCG St. Petersburg, FL, with comment about going off the air in USB at 1237. NMB-USCG Charleston, SC, with Securite announcement in USB at 0117. (Eugene Lish-Seminole, FL)

2824.0 PCH-Scheveningen Radio, Netherlands, with female operator giving a weather broadcast and ice reports in both Dutch and English in USB at 0337. (Bill Fernandez-MA)

3150.0 PCD-Israeli Mossad number station in AM at 0330. (Fernandez-MA)

3296.0 RPFNG-Unknown Portuguese military with 75 baud RTTY RY and foxes test tape at 0200. (Jacques d'Avignon-Cornwall, ON) *Looks like they work Horta, Jacques-Larry.*

3417.0 English female 5-digit Israeli Mossad number station in AM at 0207 Thursdays UTC. (Fernandez-MA)

4007.0 US Navy MARS net on East Coast in USB at 0140. (Fernandez-MA)

4028.0 Spanish female 5-digit number station in AM at 0415. (Fernandez-MA)

4126.2 Two ship Captains discussing their runs up and down the Atlantic and their new boss in USB at 0055. (Jim Henderson-Wilmington, DE)

4146.0 KDL-Houston, TX, working barges *Voyager* and *Creole Momma* in USB at 0015. Barges reporting positions and status of unloading. (Henderson-DE)

4255.0 CFH-Canadian Forces Halifax, NS, with V CW marker at 0630. (Rick Dettman-Buffalo Grove, IL)

4373.0 NOC working Giant Killer in USB at 0318. Other, military sounding stations were on the net at the same time using abusive language. (Brown-MA)

4408.0 Halifax CCG, NS, in USB at 2340. Reporting maritime ice drift conditions on Canadian coast and in bays. (Henderson-DE)

4426.0 COMSTA New Orleans setting up secure phone patch for India 3 Tango on 4399 in USB at 0458. (Brown-MA)

4505.0 German female 3/2-digit number station parallel 4770.0 in AM at 0423. (Fernandez-MA)

4585.0 USAF CAP-Middle East taking check-ins in USB at 0214. (Fernandez-MA)

4604.0 USAF CAP Region 3 network in USB at 0217. (Fernandez-MA)

4623.0 Unidentified station in Middle East area with Fax 120/576. Seems to me very similar to Diego Garcia transmission. Very similar to what came out of Diego during the Gulf War at 0155. (d'Avignon-ON)

4722.0 RAF West Drayton, UK, VOLMET with various weather forecast in USB at 0200. (Mary Anne Kehoe-Atlanta, GA)

4788.0 TJK-ASECNA Douala, Cameroons, with 50 baud weather data at

0205. (d'Avignon-ON)

4792.0 6VU?-Unidentified station sending an excellent weather chart in Fax at 0545. No listing anywhere for this frequency. (d'Avignon-ON) *Probably Dakar, Jacques. They have been noted just down frequency in RTTY-Larry.*

4880.0 ULX2-Israeli Mossad number station in AM at 0431. (Fernandez-MA)

5000.0 YVTO-Time Station Caracas, Venezuela, under WWV with time pips at 0319 in AM. (Bob Pettengill-Blanchard, OK)

5150.0 German female 5-digit number station in AM at 0102 Sunday UTC. (Fernandez-MA)

5297.0 German female 3/2-digit number station in AM at 0302. (Fernandez-MA)

5301.0 Czechoslovakia female 5-digit number station in AM at 0305. (Fernandez-MA)

5437.0 English female 5-digit Israeli Mossad number station in AM at 0228. (Fernandez-MA)

5587.0 Unidentified military stations with chatter in USB at 1356. (Gerald Brookman-Kenai, AK)

5598.0 Navy LJ24N working Santa Maria Radio in USB at 2110 with flight ops message. (Brown-MA)

5604.0 Rainbow Radio - Tor Cove, NF, with several Delta aircraft giving flight data/position reports to their company in USB at 0231. (Fernandez-MA)

5616.0 Delta 66 working Gander, NF, Radio with Air Traffic Control advisory in USB at 0217. (Brown-MA)

5696.0 CG Rescue 1700 working CAMSPAC San Francisco, CA, with guard request in USB at 1204. (Brown-MA)

5700.0 Aircraft with tactical ID on Papa 381 asking for radio checks in USB at 0703. (Fernandez-MA) Pipeline (NCS/Base Station) working Gonzo 03 Charlie and taking an immediate message and position report. This info was to be passed to Mike Oscar Charlie Halifax. Pipeline gave out primary frequency of 5700 and secondary of 6712 in USB at 0436. The Gonzo flights are common on the Canadian frequencies particularly in the evenings. Pipeline is the station I previously mislD'ed as "Flightline" in a previous logging. This must be a CANFORCE tactical traffic, and maybe these two frequencies are new Canadian tactical frequencies. As common as the Gonzo flights are, I've seen no mention of them in the hobby press. (Jeff Haverlah-Humble, TX)

5732.0 Talon 81, USAF C-130 with location report on military training route. Ground station not heard or identified in USB at 0019. (Metcalf-KY)

5870.0 USN Key West, FL, with coded message at 0442 in USB. (Dettman-IL)

6236.0 CG 1719 working CGC *Legare* which assumed his radio guard at 0413 in USB. (Brown-MA)

6344.0 WLO-Mobile Radio, AL, with DE CW marker at 0450. (Dettman-IL)

6365.5 KFS-San Francisco Radio, CA, with DE CW marker at 0452. (Dettman-IL)

6376.0 WCC-Chatham Radio, MA, with V CW marker at 0455. (Dettman-IL)

6513.0 CGC *Harry Lane* with phone patch through COMSTA Portsmouth, VA, in USB at 0000 reporting expected arrival at noon the next day. (Henderson-DE)

6575.0 Delta 98/40 working New York aero in USB at 0147/0148. (Kehoe-GA)

6632.0 Sydney Aeradio working Quantas 128 in USB at 1250. (Lish-FL)

6676.0 VLS-Sydney VOLMET, Australia, with English USB aviation weather at 1134. (d'Avignon-ON)

6705.0 Changer 01 working Trenton Military in USB at 0325. (Fernandez-MA)

6713.5 "Gram, Gram this is Justice" in USB at 0335 with coded frequency change information. (Brown-MA)

6734.0 Boulmer Flight Watch working 3XH (aircraft) passing data in alpha numeric form on Delta Kilo in USB at 0733. (Fernandez-MA)

6745.0 CIO2-Israeli Mossad number station in AM at 0248. (Fernandez-MA)

6750.0 Offutt AFB with phonetic message in USB at 0108. (Lish-FL)

6812.0 Air Force One working Andrews AFB enroute to Little Rock, AR, at 1345 in USB. (Carl Pinsonat-Plaquemine, LA)

6840.0 Spanish female 4-digit number station in AM at 0236. (Mikell Goetsch-Pittsburgh, PA)

6952.0 Spanish female 5-digit number station in AM at 0207. (Goetsch-PA)

7423.0 Spanish female 4-digit number station in AM at 0318/0402. (Goetsch-PA)

7425.0 Spanish female 4-digit number station in AM at 0010. (Mike McDaniel-West Bloomfield, MI, via Grove BBS)

7600.0 HD210A-Time Station Guayaquil, Ecuador, in AM at 0050. (Goetsch-PA)

7605.0 VLB2-Israeli Mossad number station in AM at 0342. (Goetsch-PA)

7860.0 Spanish female 5-digit number station in AM at 0332. (Goetsch-PA)

- 7918.0 Israeli Mossad 5-digit number station in AM at 0408. (Fernandez-MA)
7990.0 USN station Met Norfolk calling First Weather and MC-1 in USB at 2349. Also passing messages using an unknown data mode. This frequency also active with CW, a Spanish network, packet and whistling. Met Norfolk and MC-1 switched to 13890.0 at 0041. (Metcalfe-KY)
- 8000.0 JJY-Time Station Sanwa, Japan, with AM time pips and CW ID at 0753. (Fernandez-MA)
- 8056.0 US military stations W3A and 1N heard in USB at 2208. Similar operations involving 6T and 9K on 8058.0 a few days later. (Metcalfe-KY)
- 8125.0 KEM80-FAA Washington, DC, with NARACS exercise traffic at 1829 in USB. KJB96-FAA Aurora, IL, with 75 baud ASCII message at 1834. (Metcalfe-KY)
- 8240.0 USS Mississippi calling USS Shreveport at 0618, no joy. (Dettman-IL)
- 8665.0 Spanish female 5-digit number station in AM at 0308. (Fernandez-MA)
- 8822.0 November 355QS working Rockwell Flight Test in USB at 1811. (Brown-MA)
- 8828.0 Unidentified station calling AZ0(?) on frequency "Cinco" at 1250 in USB. (Harry Riddell) Honolulu Volmet, HI, with various weather observations and forecast in USB at 0630. (Kehoe-GA)
- 8846.0 New York Radio working CANFORCE aircraft in USB at 2050. NY told them to use CANFORCE guard frequency of 3703. (Brown-MA) *That's an interesting frequency, Henry. Wonder what my ham friends on 75 meters would think of that one-Larry.*
- 8861.0 Dakar Aeradio, Senegal, working various aircraft in USB at 0230. (Pettengill-OK)
- 8861.0 Air France 527/Alitalia 575 with position reports to Dakar, Senegal, in USB at 0235. (Kehoe-GA)
- 8891.0 Para 623 working Iceland Radio in USB at 0319. Cambridge Bay working Air Canada 853 in USB at 0329. (Brown-MA)
- 8906.0 King 52 working New York Radio in USB at 2046. (Brown-MA)
- 8933.0 Springbok 681 (South Africa Airways) with a position report to Johannesburg Aeradio in USB at 0205. (Kehoe-GA)
- 8967.0 Jeddi Lead working Jeddi 3 in USB at 0328. Offutt working Chill 41/43 in USB at 0351. (Brown-MA)
- 8984.0 CG 1702 working COMSTA Kodiak, AK, in USB at 0219. (Brown-MA)
- 8997.0 Unidentified station AFA2 (no phonetics used) ending an EAM at 1510. (Fernandez-MA)
- 9023.0 Blue Crab calling Deephunter for HF check, then went secure (green) communications in USB at 0921. (Brown-MA)
- 9090.0 English female 3/2-digit number station in AM at 2124. (Fernandez-MA) Same at 2115. (Brown-MA)
- 9805.0 X0Y and LZN possibly USAF in USB at 1756. X0Y reported deteriorating weather conditions at his location. (Metcalfe-KY)
- 9914.0 KIT88-FAA Martinsburg, WV, and KJB96-FAA Aurora, IL, in LSB at 1907. This is FAA channel 10. At one point, FAA stations were active here in voice and ASCII in LSB and voice only in USB. (Metcalfe-KY)
- 10291.0 UN Western Sahara working Bent King via a phone patch through Portishead Radio in USB at 2125. Informal comms with some military administration talk. Bent King somewhere in UK, the other in a desert environment as Bent King was making jokes about others with camels. Both careful not to divulge any info that would relate to either's location. (Fernandez-MA)
- 10493.0 WGY905-FEMA Battle Creek, MI, running network as net control station in USB at 1738. WGY912-Berryville, VA, calling various stations in USB at 1821. (Dettman-IL)
- 10670.5 T2 and F2 here in USB at 0008, discussed setting up data comms & returning to battalion frequency. (Metcalfe-KY)
- 10918.0 WWJ48-FHWA Lakewood, CO, and WWJ89-FHWA Bismark, ND, on FHWA Region 8 frequency F34 in USB at 2208. (Metcalfe-KY)
- 10993.5 Q3B-USN? with EAM in USB at 2030 and 2104. (Metcalfe-KY)
- 11133.4 6Q working D1D, 70, JJ, EFT at 1315 in USB. Sounded like military target practice or air intercept. (Harry Riddell) *I vote for the latter, Harry; looks like stuff I have seen them do before. Now if we could just figure out the branch of military doing this, I'd be happy-Larry.*
- 11123.0 English female 5-digit number station in AM at 1429. (Pettengill-OK)
- 11176.0 Hilda to Reach 347 in USB at 0000. Griffiss and Andrews AFB were closed so aircraft redirected to Dover AFB. (Henderson-DE) Ambition (USAF) asking McClellan AFB for HF frequency check USB at 2203. Tried 11408.0, 14867.0, 15015.0, 15044.0, 15687.0, and 16121.0 kHz. (Metcalfe-KY)
- 11494.0 Stations 207 and 203 reporting problems with voice privacy mode in USB at 2014. (Metcalfe-KY) Offutt AFB, NE, with a 56 character EAM in USB at 1822. (Richard Marcotte-Chico, CA)
- 11179.0 Spanish female 5-digit number station in AM at 2010 Saturdays UTC. (Fernandez-MA)
- 11214.0 Lima 20 working Trenton Military in USB. (Fernandez-MA)
- 11233.0 CANFORCE 400 working Trenton Military, ON, in USB. (Fernandez-MA)
- 11243.0 Offutt AFB, NE, with skyking EAM in USB at 1844. (Dettman-IL)
- 11279.0 Aktyubinsk VOLMET, Russia, with Russian aviation weather at 0343 in USB followed by Alma Ata at 0345. (Fernandez-MA)
- 11306.0 American 903/963 working Lima Radio in USB at 0322/0326. (Brown-MA)
- 11535.0 Cassity and Echo 1 possible USNG with mention of KL43 transmission at 1722 in USB. (Metcalfe-KY)
- 12158.0 Unidentified station WTDL checking into FHWA winter exercise in USB at 2025. FHWA may have moved quarterly exercises to February, May, August and November. (Metcalfe-KY)
- 12631.9 WOO-Ocean Gate Radio, Manahawkin, NJ, with traffic list using SITOP-B at 1715. Using one of AEA's new DSP-1232 data controllers and I can report that signal copy under weak or crowded conditions is superb. (Metcalfe-KY)
- 13175.0 Unidentified station with Spanish news 50 baud RTTY at 0425. (d'Avignon-ON)
- 13330.0 Florida West 521 calling Houston for departure message. Leaving airport in Colombia for Bogotá and was told to use 10075 for future communications in USB at 0219. (Brown-MA)
- 13333.0 London, England, LDOC with flight data and weather for UK in USB at 1545. (Fernandez-MA)
- 13459.2 KJK73-FAA Los Angeles, CA, with 75 baud ASCII message for KCP63 FAA Longmont, CO. (Metcalfe-KY)
- 13528.5 US Navy MARS NNN0MCL working NNN0CSQ in USB at 2200. (Lish-FL)
- 13780.0 HFM36-KCNA Pyongyang, North Korea, with 50 baud RTTY news at 0410. (D'Avignon-ON)
- 14408.0 AGA3HS-US Army MARS with phone patch to Panama in USB at 2147. (Lish-FL)
- 14452.5 VXN9/91-CFARS Cyprus working CIW with phone patch in USB at 1720. (Lish-FL)
- 14818.5 Various US Navy MARS afloat units with phone patch traffic in USB at 2250. (Lish-FL)
- 15015.0 Kilo Foxtrot 196 calling Elmendorf AFB but raising briefly and working Yokota. Weak but propagationally "bright". Frequency mostly, typically dead for this time at 0305 in USB. (Haverlah-TX) Shark 2A working Albroom and Lobo in USB at 1601. (Lish-FL)
- 17272.0 PPR-Rio Radio, Brazil, with phone patch traffic in USB at 2150. (Lish-FL)
- 17975.0 Offutt AFB, NE, with EAM at 1659. (Fernandez-MA)
- 18881.0 English female 5-digit number station in AM at 1700. (Tom Mazanec-Maple Heights, OH)
- 20678.5 US Navy MARS NNN0NAL working NNN0HLQ in USB at 1648. (Lish-FL)
- 20936.0 Unidentified US Navy MARS station working NNN0CSQ in USB at 1607 with phone patch traffic. (Lish-FL)
- 20940.0 Various US Army MARS stations in USB at 1800. (Lish-FL)
- 20962.0 CIW602-CFARS working VXE9-Egypt on Golf frequency in USB at 1815. VXN9-CFARS Cyprus with phone patch traffic in USB at 1700. (Lish-FL)
- 20970.0 CIP91-CFARS working CIB-Bahrain in USB at 1905. VXN91-Cyprus working several stations in USB at 1625. (Lish-FL)
- 22011.0 English female numbers station in AM at 0025. (Henderson-DE)
- 22222.0 English female 5-digit number station in AM at 1600. (Mazanec-OH)
- 22557.0 KPH-San Francisco Radio, CA, with DECW marker at 1652. (Dettman-IL)
- 22801.0 Radio talk show host working vessel *Great American II* through phone patch in USB at 0013. Boat attempting to break record for sailing from New York to California. (Henderson-DE)

Dave Glow,
Townsend,
MA, is a big
collector of
utility QSLs.



QSL

Defense Civil Preparedness Agency
Radio Station / WGU 20 / 179 Kilohertz
1st 50 KW / All Solid State AM Transmitter
Chase, Maryland

The Scanning Report

Bob Kay

clo MT, P.O. Box 98
Brasstown, NC 28902

Vacation Fun

Have you been yearning to monitor the big city action of Los Angeles or New York? Have you thought about scanning from a cruise ship? Or maybe you're thinking about scanning from a motel that is located near an Air Force test site? Well, stop thinking about it. June is vacation month — it's time to take a scanning vacation!

Scanning vacations can be fun and entertaining. With the proper planning and equipment, you can bring along the entire family, and still enjoy an action packed scanning vacation. Here's what you'll need to do.

Today's micro technology has dramatically reduced the size of our equipment. A voice activated tape relay, tape player, frequency counter, headset, and scanner radio, will easily fit into a standard brief case. Best of all, everything can be powered from batteries! If you're familiar with a few basic hand tools, you can add an external antenna and headset to a brief case and transform it into a portable scanning station.

Vacations by automobile offer a wide variety of mobile scanning opportunities. To monitor the roadside action, you'll need a magnetic mount antenna and a 12 volt adapter. Both items can be purchased from Radio Shack, Grove Enterprises and others for \$40-\$50. Scanning with this type of system is highly practical when traveling by car. Vehicle theft can be deterred by removing the antenna, disconnecting the power supply and placing the entire rig in the trunk.

A completely portable scanning rig is especially handy if you're driving through a state that prohibits mobile scanning. It only takes a few seconds to pull off the road, and to completely remove the "illegal" components.

Discovering frequencies in unfamiliar places can be a frustrating experience. Radio Shack stores will usually provide free local frequency lists. Another place to check is the local gas station. Tow truck operators will monitor the police, fire and ambulance frequencies for possible towing opportunities. Frequencies can also be obtained by visiting a fire station. Volunteer fireman are usually eager to share public service frequencies with radio hobbyists. To show your appreciation, take along a few extra copies of *MT* and share the magazine with your new friends.

Scanning is usually considered to be a localized hobby, but there are national scanning frequencies that can be monitored throughout the United States. Take along the following frequencies and check them out during your vacation (all freqs in MHz):

40.50	Army search/rescue
41.50	Army aircraft
46.61	
to 46.97	Cordless phones
47.42	Red Cross
123.45	Pilots air to air
126.200	Military air towers
155.34	Hospital/mutual aid
156.8	Boats/distress
163.20	U.S. Marshall
165.2875	ATF (Alcohol, Tobacco & Firearms)
165.375	Secret Service
165.95	IRS (Internal Revenue Service)
167.05	FCC (Federal Communications Commission)
167.5625	FBI (Federal Bureau of Investigation)
170.875	Federal prisons
236.600	Air Force towers
241.000	National Guard
381.800	Coast Guard Aircraft

Going on vacation? Don't forget your scanner radio. A compact, but formidable scanning system will easily fit into a brief case.



415.20	Federal Protection Service
463.175	Paramedics

In addition to the above, don't forget to check out the itinerant frequencies which can also be monitored throughout the United States. Itinerant frequencies are used primarily for business communications. From hot air balloon rides to the traveling circus, the itinerant frequencies are noted for providing some very diversified listening.

MHz	27.49	35.04	43.04	151.505	151.625	158.400
	451.800	456.800	464.500	464.550		

The news media can be monitored in any city by searching through 450.00 and 455.00 megahertz. In repeater operations, the input can usually be found in the 455.00 area, with the output on a frequency five MHz lower. Monitoring the news media from your vehicle can be very informative. For example, the information that traffic reporters send to radio stations is usually delayed by several minutes. Your scanner radio will allow you to hear and instantly respond to changing traffic conditions.

These are just a few of the scanning opportunities that you can monitor while on vacation. And as I've already mentioned, today's equipment is lightweight, battery powered and fully portable. So remember, if you want to be entertained prior to your arrival, while relaxing wherever you stay, and during the return trip home, take a scanning vacation.

Treasure Hunt

These lazy, hot days of summer will give a real workout to your vehicle's air conditioning. When you're in the car with the A/C on high, it's nearly impossible to hear your scanner radio.

Poor audio from your scanner radio can be instantly solved by installing the HTS-2 Amplified Speaker from Naval Electronics. The HTS-2 is a compact, professionally crafted extension speaker that will provide more than a full watt of distortion free audio through a 3.5" speaker.

Power for your HTS-2 can be provided by the vehicle's 12 volt battery, or from internal "AA" batteries. The HTS-2 also has an internal NiCd battery charger and an automatic shut-off feature that saves battery power when your scanner radio is squelched. When the internal amplifier is manually switched off, the unit becomes an ordinary extension speaker.

To win the HTS-2, simply answer the following clues:

1. Provide the phone number of Naval Electronics in Tampa, Florida.
2. What is the "Blue Dot" frequency?

3. What type of frequency is 151.505?
4. Your scanner radio's IF is 10.7; the image frequency will be 21.4 higher. True or False?
5. Provide a frequency within the six meter Ham band.

Other features of the HTS-2 include a "tape trigger" that can activate a tape recorder and an "input level" adjustment that can be fine tuned to match the input from your scanner radio.

Send your entries to the Treasure Hunt, P.O. Box 98, Brasstown, NC 28902. Please observe the following rules: Fax entries and bulk mailings will not be accepted. Post cards are recommended and encouraged.

Frequency Exchange

Since we started the column with vacation thoughts, let's begin the Frequency Exchange with a visit to **Disney World** in Orlando, Florida.

151.655 Travelodge International	462.675 EPCOT Trouble Desk
151.895 Submarines	462.775 Disney Parade
154.625 Hilton in Disney	462.85 Disney Parade
157.74 Buena Vista hotel in Disney	463.75 EPCOT Security
450.0625 Magic Kingdom	463.975 Disney Custodial
450.1875 Magic Kingdom	464.125 Disney World Security
453.825 Disney Ambulance	464.40 Magic Kingdom
453.875 Disney Fire	Security
453.925 Disney Fire	464.625 Magic Kingdom Trouble
461.60 Disney Operations	Desk
461.70 MGM Studios	464.80 MGM Studio Operation
462.475 Disney Utilities Maint.	476.575 Monorail in Lake Buena
462.55 EPCOT Entertainment	Vista
462.575 Disney Monorail	

The above frequencies were provided by John Emery, from Xenia, Ohio. Our next vacation stop will be **Disneyland** in California. The following frequencies were submitted anonymously:

42.98 Transportation	464.4875 Parking
151.745 Disney Hotel	464.5125 Special Events
154.57 Submarines	464.5375 Maintenance
154.60 Trains	464.6375 Emergency
464.0375 Crowd control	464.6425 Security
464.325 Security	464.7625 Trains
464.4125 Maintenance	469.325 Security
464.4625 Security	

Place your bets, folks. It's time to test your luck in **Las Vegas**. Rick Kennedy lives nearby and here are his favorite casino and hotel frequencies.

151.665 Airport Casino	461.90 Horseshoe Club
152.48 Dunes Hotel & Casino	462.825 Bally's Grand Hotel
154.515 Aladdin Hotel	462.875 Golden Gate Casino
154.54 Hotel International	462.90 Sand's Hotel & Casino
158.46 Riverboat Casino	463.45 Aladdin Hotel & Casino
460.95 Showboat Hotel & Casino	463.60 Grand Resorts
461.225 Airport Inn	464.225 Barbary Coast
461.425 California Hotel & Casino	464.375 Caravan Travel Lodge
461.55 Golden Nugget Hotel	464.425 Desert Inn
461.70 Caesars Palace	464.90 Vegas World Hotel

Since we didn't win the million dollar jackpot, let's save our money and travel to **Virginia Beach, Virginia**. Russell Swette is a local resident and he has invited us to enjoy the following:

45.68 Chesapeake Bay Bridge
138.65 Little Creek Naval Air Base
138.70 Naval Shore Patrol
140.225 Oceana Naval Air Station

GUIDE TO UTILITY STATIONS 1993

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151.665 Pavilion Towers Hotel
151.715 Barclay Towers
151.805 Sheraton Beach Inn
155.235 Ocean Rescue
159.435 Virginia Game Commission
407.475 Fort Story Military Police
851.0375 Animal Control

Since we're already in Virginia, let's stop at the home of Scott Hinkle. Scott has invited us to relax and monitor the frequencies of **Colonial Williamsburg and Bush Gardens**.

Williamsburg	Bush Gardens
151.775 Maintenance	463.425 Maintenance
154.145 Fire Department	463.575 Maintenance
460.05 Police Department	463.775 Security
463.625 Security	464.175 Maintenance
463.90 Maintenance	

Other nearby attractions	
39.06 York River State Park	151.805 Hilton Inn
140.20 Naval Weapons Station	151.925 Fort Magruder Inn
151.235 York River State Park	158.76 College of William & Mary
151.40 York River State Park	168.425 Colonial Nat'l History Park
	464.175 Kingsmill

Our final vacation stop is the **Baltimore Aquarium** in Maryland. An anonymous contributor sent in the following:

154.31 Fire Boats	156.70 Harbor Safety
156.425 Dock Master	453.20 Police Boats
156.50 Boat Launch	453.30 Waterfront Police
156.60 Fell's Point Boat Repair	461.775 John Hopkins Hospital

464.475 National Aquarium	Public Service (Trunked):
464.825 National Aquarium	856.2125 856.4625 856.7125
464.8625 Power Plant Night Club	856.9625 857.2125 857.4625
464.9125 Phillip's Harborplace	857.7125 857.9625 858.2125
464.975 National Aquarium	858.4625 858.7125 858.9625
494.9875 Arena/Convention Center	859.2125 859.4625 859.7125
	859.9625 860.2125 860.4625
	860.7125 860.9625

To invite the Frequency Exchange to your home, send a list of your favorite frequencies to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

911 Anonymity Revisited

In a past column, I mentioned that 911 callers could protect their anonymity by using a portable cellular phone. Readers responded with the following suggestions.

"If your area has 'call blocking,'" wrote P.A. Jensen, "dial *67 prior to dialing 911 and it will prevent the system from revealing your phone number and address." Another reader claimed that your local phone company can permanently install "call blocking" if you ask for it.

Lastly, there were a few readers who disagreed with my suggestion of using a portable cellular phone. "Cellular phones can be tracked and the caller identified," wrote an anonymous reader. After all, the cellular service has a record in order to bill you for the call. "The only way to guarantee complete anonymity is to use the pay phone on the corner."

Civilian vs. Police Dispatchers Revisited

The response remains split down the middle: Fifty percent of you believe that the performance of civilian dispatchers can rival or surpass the performance of dispatchers who are sworn police officers.

When I asked who made the better dispatcher, a man or woman, the results were quite surprising. The majority of letters favored the female dispatcher. The comments of Pat Stawicki, from Norman, California, were typical of your response. "Women have a better memory, they have more interest, and they exhibit a good temper mixed with humor."

What do you think? Send your comments to the Scanning Report, P.O. Box 98, Brasstown, NC 28902. All requests for anonymity will be granted.

Clean Contacts

Gene Hughes, editor of *Police Call*, says that dirty and/or corroded coax cable connectors are the number one cause of degraded reception

HEY SPORTS FANS!
CHECK OUT THE HOTTEST
CRAZE IN SPORTS
COMMUNICATIONS.



CHECK YOUR SCANNER
DIRECTORIES FOR THE
CURRENT LISTINGS FOR
AUTO RACING FREQUENCIES.
CATCH ALL THE ACTION
WHILE THE DRIVERS
COMMUNICATE DIRECTLY
WITH THE PIT CREWS!

Sammy the
Scanner

Northeast Scanning News, P.O. Box 62, Gibbstown, NJ 08027

on VHF, UHF, and 800 megahertz. Gene suggests cleaning the contacts with "Rain Shower." According to Gene, Rain Shower is an electrical spray that is non-conductive and perfectly safe on plastics. Gene says that it can be purchased at stores that carry electrical and electronic supplies.

Prank 911 Calls

Three deputies and two dispatchers at the Hernando County, Florida, Sheriff's Office, have been fired for making prank 911 calls. The five men allegedly called in more than a dozen prank calls to 911 during their off hours. The men claimed that it was an innocent prank designed to irk their fellow police officers who were still on duty. (News clipping from the *Hernando Times*.)

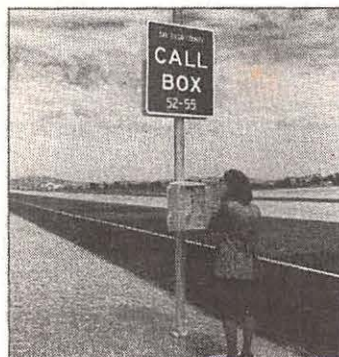
Watch Your Head

What weighs 19 pounds, flies through the air at 70 miles an hour and has a 15 inch propeller turning 10,000 rpms? It's a remote controlled model airplane and it may be flying out of control!

In the United States, it is estimated that over a half-million people fly radio-controlled planes. The FCC is trying to make more room on the airwaves by narrowing the channels used by radio controlled models.

The Academy of Model Aeronautics, an association of model plane owners, claims that the channels used by radio hobbyists are already crowded. According to the academy, the narrowing of channels will result in signal interference, and uncontrolled crashes throughout the nation. (News clipping from *Grand Rapids Press*.)

Broken Call Boxes



If you're traveling on the Florida Turnpike, the emergency call boxes may not work. Turnpike spokesman, Kim Poulton, explained that the boxes transmit a low power beeper signal that is often affected by other signals. Poulton says that the Turnpike commission is working with the FCC to correct the problem.

In the meantime, Poulton suggests that motorists who use the boxes should hear a "beep" after they push the button. "If you don't hear the beep," Poulton says, "try again in a few minutes." (News clipping from John F. Combs.) Our picture is from a California brochure, not the Florida system.

Cellular Safety

Are the microwave radio signals from cellular phones cooking our brains? According to the Food and Drug Administration (FDA), there's no proof at this time that cellular phones are harmful. In an FDA "Talk Paper," dated February 4, 1993, the FDA claims that there is not enough evidence to know for sure, either way. The FDA is actively working with other federal agencies to assure that research is undertaken to provide the necessary answers.

The FDA stated that it could impose a performance standard on the manufacturers of cellular phones if the evidence showed a health need.

Next Month

More scanning tips, hints and ideas that will increase your summer scanning fun.

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Being a Beginner

People often ask me, "Hey, Uncle Skip, why are you so excited about beginners?" This is probably the easiest question that gets thrown my way. Learning something — anything — is the greatest experience in life. Being there, helping a beginner through those first steps in the radio hobby, is a very rewarding endeavor — almost as much fun as being a beginner.

The radio monitoring hobby is a lifelong learning experience. Few of us settle for a single mode of operation. You may start out as an SWL, but after a while you may move on to new pastures in the form of utility or clandestine monitoring, and so forth. Every now and then, the development of a new technology presents an opportunity for even the most entrenched of old-timers to experience the fun of being a beginner.

I have always maintained that the addiction of our hobby is centered around trying to relive the thrill of our first fifty contacts. In fact, I recently became a beginner again by jumping feet first into the realm of packet radio. It was a humbling but exciting experience, and the steps I followed can probably be applied to any beginner's experience in the radio monitoring world. Maybe in the rest of the world, too.

Stop Making Excuses

Packet radio is one of the more recent digital modes made available to the amateur radio community. It has been a legal form of ham communication in the United States since 1980. So why has it taken Uncle Skip thirteen years to dip his big toe into the packet pool? Excuses mostly. "Who needs another mode? I don't use them all now!" "It's too expensive." "I don't have the time." "The learning curve is too steep. You

can't teach an old dog new tricks."

Most excuses fall into one of three camps: fear, laziness and expense. The whole purpose of my monthly column is to jump start folks over the first two types of excuses and find ways around the last one. How do I use my column to get folks excited enough to try new and different things? I try to use the most successful motivator around: FUN! Once I came around to the idea that packet radio might be fun, there was no stopping me. Take one dose of fun and stir in a bit of curiosity and you have the basic formula for the beginner's experience.

What else do I use Beginner's Corner for? Never forget that knowledge is power. Being a successful beginner centers on making haste ... SLOWLY. Not a month goes by that I don't get a letter or two from someone who spent a lot of money on hardware based on little or no advice. It then falls to folks like Old Uncle Skip to help these folks make the best of what often is a bad situation. The trick here is to open your mind long before you open your wallet. Since getting into packet radio involved some new hardware, it provided me the opportunity to practice what I preach.

Read the Magazines

Few of us go after a new radio pursuit totally ignorant of mode and method. Since you are reading *MT* you can see that there's all sorts of stuff to hear. You will also find articles on what people are using to hear it with. Magazines about the hobby will begin to point you down the pathways that interest you.

I had been reading about packet radio in the pages of several ham magazines. Over a period

of several months I came to learn that packet radio was a system that uses a computer, transceiver and a device known as a Terminal Node Controller (TNC). This setup allows a ham to send "packets" of data to other hams. It is an extremely efficient mode of communication that lends itself to public service use (an area of my personal interest). Since I owned a computer and a few transceivers (You will need an Amateur Radio License to play packet) all that I needed was to acquire one of these TNC thingies, right? This is where most beginners spin off into trouble.

Knowledge is power, but a little knowledge can be dangerous. Here is where those folks who send me those sad letters often start to go wrong. They know they need a new piece of equipment and they rush out, in their enthusiasm, to buy it. Perusing the ads in the backs of those ham magazines taught me that Terminal Node Controllers can cost anywhere between \$50 and \$1000. This is an awfully big gap in price. Obviously not all TNCs are created equal. Clearly I had some more learning to do. So I looked to the magazines to point me toward further information.

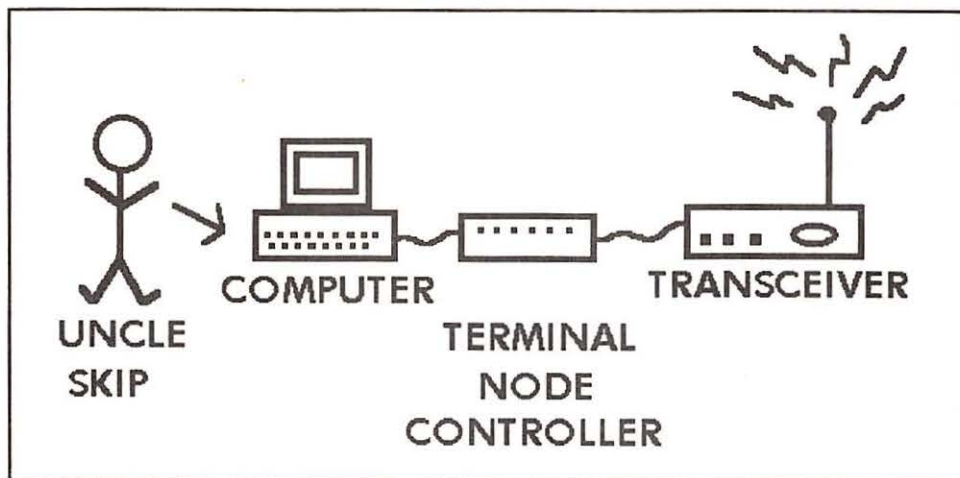
Read the Books

Most radio hobby magazines, *MT* included, have among their advertisers radio oriented booksellers. Contacting these resources turned up several books that would help me move closer to getting my packet station on the air.

- *Your Packet Companion* by Steve Ford WB8IMY, \$8.00; American Radio Relay League, Inc.; ISBN: 0-87259-395-9
- *The Packet Radio Handbook* by Jonathan L. Mayo KR3T, \$16.95; Tab Books; ISBN: 0-8306-3222-0
- *PROH: Packet Radio Operators Handbook*; by Buck Rogers K4ABT, \$12.95; MFJ Publishing.

Armed with these three texts, I was able to immerse myself in the lore of packet radio. I learned about the various ways packet radio is used and the types of equipment required for each use. I also discovered that I could begin my packet quest with a low cost TNC, which saved me well above the cover price of these three books. They also explained the process of properly connecting various computers, TNCs and radios together so that they actually would work in concert with one another — important information when moving voltage and signals between expensive pieces of equipment.

I also discovered that there were many choices in the area of software for the budding packeteer. Remember, this is a radio pursuit that involves computers. Knowing which software would work



Learning about a new mode of radio communication can be great fun!

with which TNC was also a potential money saver.

The books discussed the most useful frequencies for packet operation, and what could be heard on those frequencies. Packet radio is a place of networks, digipeaters (short for digital repeaters) and Bulletin Board Systems. I was already familiar with BBSing over the phone lines via GENIE, MT and other BBS systems. The BBS operations on packet are similar, with the additional plus of not tying up the family telephone. My spouse and sons like it already!

Use the Phone

Before the family got too comfortable with my BBSing over radio waves instead of phone lines, there were a couple of calls to make. Both the magazines and the books I had read listed equipment and software manufacturers. Once I had learned which TNCs and software packages would work best with my computer and transceiver, it was time to call around and get more information.

All my calls brought forth catalogs, prices and technical data sheets. Much of the information on the data sheets would have been incomprehensible prior to reading the packet radio books. Now I was almost ready to set up my station. However, I still had not drained the knowledge well.

Seek out the Locals

We tend to think of radio monitoring as a solitary hobby, but there are plenty of folks out there who will give a beginner a leg up. The most immediately available resource would be local radio clubs. True, these are mostly Amateur Radio Clubs, which, of course, was exactly what I wanted. But, ham clubs are also resources for locating folks interested in non-ham radio pursuits. Every ham group has a few SWLs, scanner users, and computer folks.

You can usually locate local ham radio gatherings by asking around at radio and electronics supply stores. You can also write to the American Radio Relay League, 225 Main St., Newington, CT 06111 for information about hams and ham clubs in your area that cater to the needs of beginners in the radio hobby.

Don't overlook the clubs listed in the pages of MT as resources for finding folks who can help you in your pursuit of knowledge. Most clubs' very existence is built upon supporting growth in the radio hobby. You can use the "Club Circuit" column to locate local, regional and national clubs that share your particular radio interest areas. No amount of book learning can substitute for a few hours with an experienced enthusiast.

In the case of Old Uncle Skip, a trip to one of my local ham club meetings turned up information about a Packet Radio Club that met

in a nearby town. I now had access to folks who could fill in the gaps in my learning as well as provide some hands-on training and help in setting up my station.

Remember, at this point I still had not purchased any equipment. Affiliating with a few local hobbyists provided an opportunity to "try before you buy." I still wasn't completely sold on packet radio. Using another ham's station (under his guidance), I found that some stuff turned me on while other activities left me cold. I now had some first hand operating time and practical advice from folks who had played with packet for a few years to guide me.

Go For It

Armed with a ton of information and a smidgen of practical experience, I went shopping for a TNC that would not break my budget, but gave me the features I needed to get rolling in packet radio. A couple of the folks from that packet radio club came around to help me hook everything up and get me on the air. My packet radio mailbox is WB2GHA@WB2MNF if you want to make contact.

Now I am happily stumbling along, making lots of mistakes and having just about as much fun as I did when my grandfather bought me my first AM radio. Being a beginner again is just as exciting as I thought it would be. I also think I got back in touch with some feelings that can stand in the way of a beginner's success; important stuff for a certified radio sage!

Most of what is said above can apply to any aspect of the radio hobby. Just go through the column and cross out "packet radio" wherever you see it and insert whatever turns you on. Also, you Old Radio Fogies (you know who you are) are hereby challenged to get out there and learn something new. It need not involve buying a ton of new equipment. It might only mean spinning the dial on your existing receiver to places you have never been. Maybe you can throw the mode switch to a different position and discover the joys of being a beginner again. Have fun!!! That's what it is all about.

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When it comes from our readers, it's our favorite terminology. Send us your QSLs, pics of your monitoring post, your letters to the editor; let the columnists know your tips, experiences, and opinions! MT will be all the better for it.

Bits & Pieces

While giving the old Federal Files a good cleaning out, I came across some interesting items that need passing on. So let's get right to them.

Blaster From the Past

No, the photo isn't of the super secret *Aurora*, but of a hypersonic bomber study dating from the late 60's. The concept released by Republic Aviation bears the caption, "SAC bomber of tomorrow? This is one of the many designs SAC planners are studying for tomorrow's manned airplane. This Republic Aviation bomber would fly at 5,000 miles per hour, and cruise at an altitude of 120,000 feet. It would use both turbojet and ramjet engines."

The artist's concept is very similar to what the aviation press thinks the hypersonic *Aurora* might look like. Although the Republic Aviation concept dates from the '60s, it is still a very good representation of what a hypersonic aircraft would likely be. There just aren't that many ways to design a Mach 6 to 8 aircraft, and chances are that any super fast spy plane will look like the drawing. Remember the old saying? *The more things change, the more they stay the same.*

Handheld Scanner Cases

If you are like me (a bit of a klutz), then you have probably put a few dents and scratches in your handheld scanner by banging it, dropping it or just through everyday use. Since my handheld

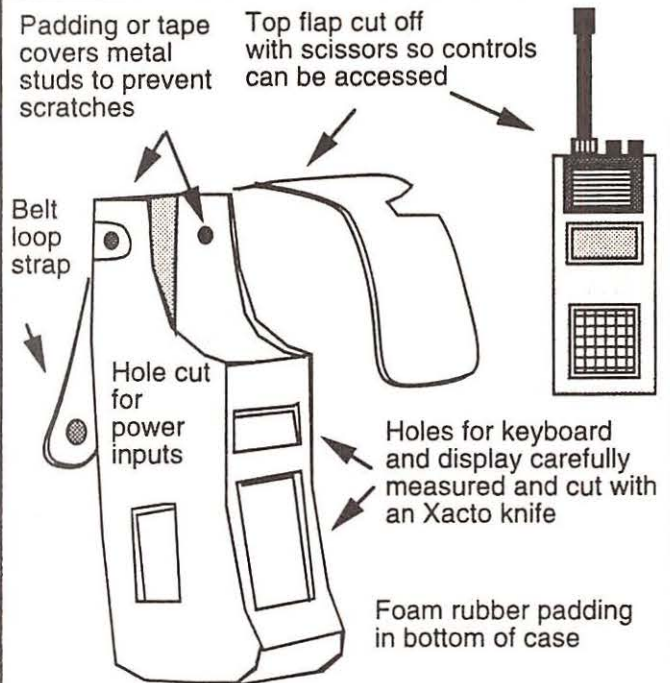
goes with me just about everywhere, it is subject to a lot of abuse. There are some good carrying cases on the market that can help extend the life of your handheld but they are either expensive or so generic that your scanner really doesn't fit well in them. Also, some of the cases just look tacky and come in purely ugly colors like blue and fluorescent orange.

What monitors need are custom made, durable leather cases like those used for professional police walkie talkies. Something that not only provides adequate protection and looks sharp, but also doesn't cost more than the scanner it holds.

Well, your Federal File editor has found just such a case, and chances are you can buy one in your town.

If your local mall has an AT&T Phone Store, then you are in luck. AT&T sells a leather cordless phone case at most of their stores for around \$15.00. The case is big enough for most handheld scanners (including my jumbo PRO-37), and with a little modification can be made into an

Adapting an AT & T leather cordless phone case for handheld scanner use.



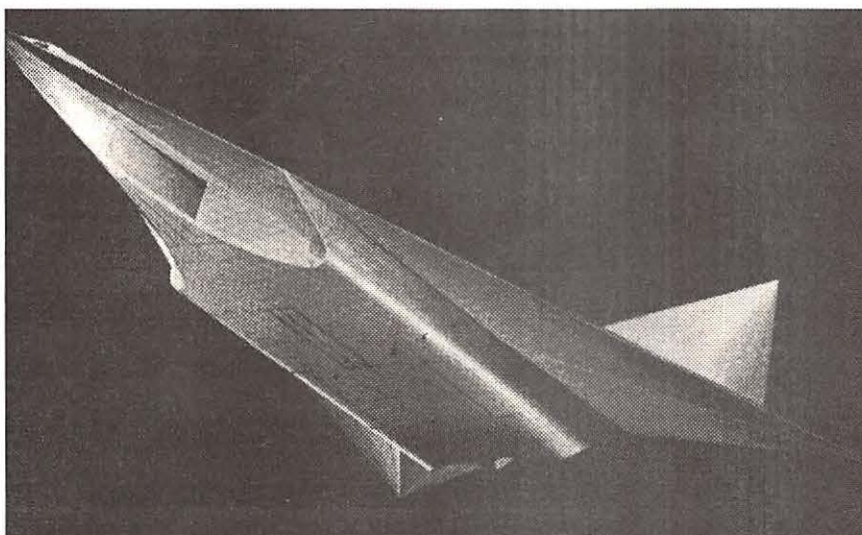
attractive, durable, professional handheld scanner carrying case.

All one has to do is trim the soft leather with scissors and an Exacto knife. I customized mine by cutting off the top flap and carefully cutting holes for access to the scanner's controls, display and powerjacks. A tight fit can be acquired by using double-stick padded tape and foam rubber for extra padding. The case has a heavy-duty, leather loop so the scanner can be worn on a belt.

Also located on the back is a brass ring. Using one of those self-adhesive plastic shower hooks, I am able to hang the scanner from the brass ring in my car for mobile monitoring. I just stuck the hook on the dash and it holds the scanner. The case costs less, works and looks better than any handheld scanner case on the market!

Enhancing the Enhanced Discone

By now, many monitors have seen the ads for or have bought one of Lakeview Company Inc's D-16+ Enhanced Discone scanner antennas. A favorite with many monitors because of its good performance at a great price (\$36.95), the D-16+ has become a welcome addition to this editor's antenna farm. But did you know you can make this great antenna even better?



Republic Aviation

"SAC bomber of tomorrow?"

Precedence Assignments

Precedence designation and prosign	Example of use	Order of handling
FLASH (Z)	Initial enemy contact reports.	A head of all other messages. Messages of lower precedence will be interrupted.
*EMERGENCY (Y)	Amplifying reports of initial enemy contact.	Ahead of all other messages of lower precedence will be interrupted.
IMMEDIATE (O)	Operation orders affecting current operations. May be assigned to administrative messages having a direct bearing on the tactical situation.	Ahead of all other messages of lower precedence, even to the extent of interrupting processing and transmission of lower precedence messages.
PRIORITY (P)	Troop movements. (Normally the highest precedence assigned to administrative traffic.)	Ahead of all other messages of lower precedence, except that routine messages being transmitted will not be interrupted unless they are extra long.
ROUTINE (R)	Messages which are not of sufficient urgency to justify a higher precedence, but must be delivered without delay.	After all messages of higher precedence.
*DEFERRED (M)	Messages which justify transmission by rapid means, but which admit the delay necessary for prior transmission of higher precedence messages.	After all messages of higher precedence.

* Presently used only by some Allied nations.

Although the discone performs better than some that sell for twice the price, it lacks sensitivity in the VHF low band (30 to 50 MHz). Reception below 50 MHz can be greatly improved with the addition of a 36 inch vertical antenna element. The simple construction of the D-16+ makes it easy, and all one has to do is attach the element to the top bolt holding the bent vertical elements. I used a steel element from an old CB antenna, bent it with some visegrips and attached it to the top bolt.

A quick search of the VHF low band frequencies quickly confirmed that reception was indeed better below 50 MHz and reception in the VHF and UHF bands seemed unaffected by the change. This fix really helps bring in the VHF low skip. You can order this antenna direct from Lakeview by calling them on their order line (1-800-226-6990) or by writing Lakeview Company, Inc. 3620-9A Whitehall Rd., Anderson, S.C. 29624.

Mailbag

Denver Data

From an anonymous source comes this list of Denver, Colorado, area commercial and military aero frequencies.

Frequency MHz

127.200/338.200
127.650/379.900
132.175/306.300
132.500/353.700
132.700/269.600
133.450/281.400
133.925/296.600
134.400/240.300
134.675/387.100
135.025/257.900
135.500/335.600
342.500

Description

Denver Center low altitude
Denver Center high altitude
Denver Center high altitude
Denver Center low altitude
Denver Center low altitude
Kansas City Center high altitude
Kansas City Center high altitude
Denver Center high altitude
Kansas City Center high altitude
Denver Center high altitude
Denver Center high altitude
Denver Center high altitude
Peterson AFB, CO

Flash Traffic

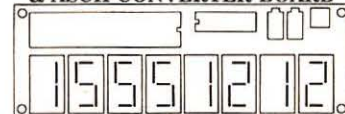
From Fed File contributor Todd Dokey comes the above handy list of military radio precedences. Keep the list in mind as you scan the military bands. Thanks, Todd.

VCR Scanner Recorder Tips

Bob Edler of Glemont, NY, writes in with some good tips for those monitors who are thinking about using an old VCR as an eight hour scanner logger/recorder. Bob says, "In the January issue, I read with interest the paragraph on the use of a VCR for the recording of scanner transmissions.

"Having done this a number of years ago to record a four hour AM radio broadcast off my Sony 2010, I found it necessary to simultaneously

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record a TV broadcast while recording the radio audio. My particular VCR (a Sears Beta model) required a video source as well in order to allow the tape speed to track properly. Without a stable video source to record, the audio was unintelligible on playback.

"In order to make this procedure work, I had to connect the 2010 to the RCA audio input on the VCR while leaving the coax TV input connected. This allowed the VCR to record the audio clearly. So if you are having the same type of problem, the above fix might solve it. It all depends on the type of VCR used."

Thanks, Bob, I am sure your tip will help a lot of monitors. Thanks for the input!

Fed File Freebie

If you are like most monitors, you can't get enough frequency information, especially if it's free. So if you'll send in an SASE to your Federal File editor at: 6303 Cornell, Amarillo, Texas 79109, we'll send you our exclusive list of the top 100 VHF/UHF military frequencies! You'll need to send a #10 envelope for the two page list. Remember, only SASEs get the list.

MT

Keeping Out of Harm's Way

Welcome aboard and fasten your seatbelts. We have a lot of ground—or airspace—to cover today. This month we continue the look we began in February at the different types of radar used in air traffic control.

At the Airport

Towers use a small radar screen called a BRITE DISPLAY. This unit shows the surface of the airport for approximately a 12 mile area. It's a very necessary piece of equipment for the controllers, especially on days when fog blocks out everything over 25 feet away from the tower (see photo).

Radar in a TRACON (acronym for Terminal Radar Approach Control) facility usually has a 50-mile control area. All of the major airports in the United States use the most advanced version known as ARTS (Automated Radar Terminal System), and most medium-sized facilities possess one stage or another of its capabilities, if not the full system.

ARTS, according to the *Airman's Information Manual* (AIM), is a generic term for the ultimate in performance afforded by several automation systems. Each differs in functional capabilities and equipment. In general, ARTS displays for the terminal controller aircraft identification, flight plan data, and associated information (altitude, speed, and aircraft position symbols) in conjunction with the radar presentation. Normal (primary) radar co-exists with the alpha numeric display (secondary radar).

In addition to making it easier to picture the air traffic situation, ARTS facilitates the transfer of aircraft and coordination of flight information within and between airport facilities. Specially designed computers and sub-systems are tailored to the radar and communications equipments and operational requirements of each automated facility.

An interesting note is that many TRACON facilities utilize both vertical and horizontal radar displays (see photo).



The tower Brite Display

The Control Center

Air Route Traffic Control Centers use a system called EARTS — En-route Automated Radar Tracking System. This is an automated radar and radar beacon tracking system whose functional capabilities and design are essentially the same as the terminal ARTS IIIA system except for the EARTS capability of employing both short range and long range radars, and use of full digital radar displays. The controllers' radarscopes are computer-generated displays of what the radar sees.

Controllers work their traffic looking at twenty-two inch bright-green-on-black tube (soon to be in color, however), plan view displays (PVDs). They can govern the range covered by the display — from approximately six miles to four hundred — although two hundred is the normal working range in a center. The computer normally updates the controller's display with each sweep of the radar antenna — each plane's target and data block (information such as flight number, altitude, computer number of the plane's center, climbing, descending, etc.) springing

forward a fraction of an inch with each turn of the radar antenna.

However, if the controller wants to keep tabs on his traffic's compliance with turns and heading changes, he can cause his display to show a half-bright history of where each plane was, one, two, three, four, or five antenna sweeps ago. Conversely, there's also a vector line-control which can show the controller where a plane will be in one, two, four, or eight minutes from any point in time — useful in making a quick determination if heading changes should be issued to keep converging planes apart.

He can also move each plane's data block to any one of eight positions relative to the target (We can do this, too, with the TRACON simulation!) and can move the data block closer or further from the target. All this is important in order to keep data blocks separate and legible when planes are flying close to each other on the screen.

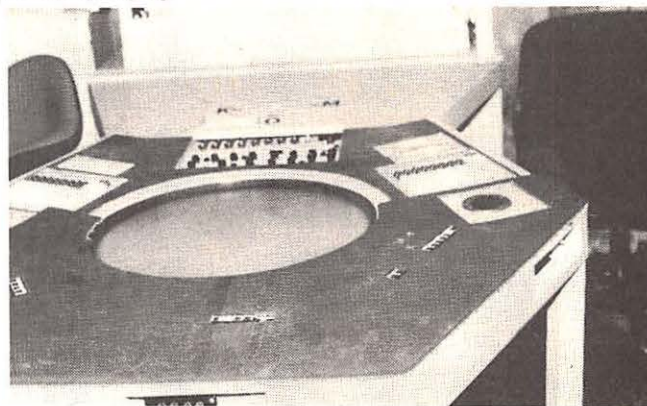
In today's fast moving world of ever-increasing air traffic, there is one feature that was born of necessity: it is the CONFLICT ALERT system. The computer places each plane in the middle of an imaginary 2-1/2-mile diameter, 2,000-foot thick wafer of airspace. The minute the edge of any two planes' wafers touch — whenever they come within five miles of each other laterally or 2,000 feet of each other vertically — their datablocks begin to blink. The warning CONFLICT ALERT also begins to blink on the controller's radar display, listing beneath it the flight numbers of the planes in potential conflict. The warning gives the controller time to turn the planes away from each other before disaster strikes.

So there you have an overview of the different types of radar used in air traffic control. There's much more to it than that, but we covered the high points. Let me know if you have any questions and I'll be glad to provide a more detailed explanation of the subject. Incidentally, air traffic is also worked in a non-radar environment, but we'll save that story for another time!

Terms Used

ARTS	Automated Radar Terminal System
ARTCC	Air Route Traffic Control Center
ATC	Air Traffic Control
EARTS	Enroute Automated Radar Tracking System
FL	Flight Level
PVD	Plan View Display
RA	Resolution Advisory
TA	Traffic Advisory
TCAS	Traffic Alert and Collision Avoidance System
TRACON	Terminal Radar Approach Control
VFR	Visual Flight Rules
VSI	Vertical Speed Indicator

*TRACON
horizontal
radar display*



Airborne Alert

The airborne version of the Conflict Alert system is the TCAS. Many thanks to John Fitzgerald, MD-80 First Officer, American Airlines, for his assistance in providing reference material for this part of the column.

What is TCAS? Again, we have an acronym: TCAS stands for Traffic Alert and Collision Avoidance System. Most commercial aircraft are TCAS-equipped today; also quite a few companies who fly "bizjets" are following suit. Here's how it works: TCAS on an aircraft can detect other aircraft in its vicinity if the other aircraft has a transponder. It cannot detect intruding aircraft which do not have an operating transponder. The TCAS equipment interrogates the other aircraft's transponder and analyzes the replies to determine range, bearing, and (if reporting altitude) the relative altitude of the intruder. If the TCAS II processor determines that a possible collision hazard exists, it issues visual and audio advisories to the crew for appropriate vertical avoidance maneuvers.

There are two types of cockpit displays for TCAS II, the Resolution Advisory (RA) display and the Traffic Advisory (TA) display. The RA display is incorporated into the vertical speed indicator (VSI). By illuminating red and green arcs around the dial it displays the required rate or limitation of climb or descent to avoid a possible collision.

The Traffic Advisory display shows the intruding aircraft's relative position and altitude with a trend arrow to indicate if it is climbing or descending at greater than 500 feet per minute. This TA display may be provided on the weather radar indicator or on a dedicated TCAS display.

The TA display identifies the relative threat of each intruder by using various symbols and colors. Complementing the displays, TCAS II provides appropriate synthesized voice announcements when the situation demands.

ATC procedures and the "see and avoid concept" will continue to be the primary means of ensuring aircraft separation. However, with the ever increasing flow of traffic, the incorporation of TCAS II in transport category aircraft adds a significant back up for collision avoidance.

John says that the TCAS is a really great system especially when weather or high density airports with busy VFR corridors (such as San Jose, CA) add to the excitement of the routine descent, arrival and landing. He adds that the planes on which he serves will run in "Traffic Advisories Only" mode during takeoff/roll through cleanup, and again while on short final until touchdown. The rest of the flight is in Resolution Advisory in a scale closest to their altitude and above/below/norm (which allows TCAS to display targets in that direction) depending on if they're climbing, descending, or holding level.



ARTCC radar

For example, climbing through 19,000, TCAS settings would be 20 mile scale and above. After leveling off at FL350, 40 mile scale and "normal."

Thanks, John. We look forward to hearing from you again soon!

Notable Intercepts

Remember the Lufthansa Airline hijacking on 11 February? Bill Battles (Manchester, NH) reports that on that day he was in his car with his VHF scanner going and heard the hijacked Lufthansa flight #592 calling Manchester Airport Approach Control on 118.800 MHz. The pilot told the controller that they were a hijacked flight and were attempting to contact JFK International Airport — but every time they made contact, a woman on the frequency blocked out their radio calls, and they were requesting Manchester's assistance. Bill tells us that at this point, Manchester started re-routing aircraft on approach and went to "quiet mode."

Later, in another radio exchange of a flight to Pease Tower (controlled by Manchester Approach), a pilot inquired about the Lufthansa radio interference and asked if that was the hijacked Airbus. The Tower controller replied that it was and that apparently, JFK was using 125.05 MHz (other half of the Pease/MHT pair). The Airbus flying over the area at FL370 (thirty-seven thousand feet) was getting override from the local pattern control comms by Manchester making it impossible for the Lufthansa pilot to hear JFK!

Great catch, Bill! He says that the irony of the whole thing was that he had several receivers at home going at once trying to find the flight on HF with no joy, but did hear them on VHF without any intention of doing so!

That's it for now. Remember, the season for tornados, thunderstorms, windshear and other nasties is upon us, so please take care. And speaking of windshear, we'll describe an example of how you can actually see the way windshear/microbursts affect aircraft in our next column and also look at a new outlet for aero charts, maps and other goodies! 73 and out.

MT

ASA

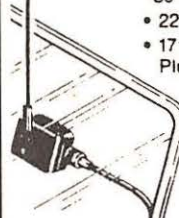
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LowSpeak — A Primer to Longwave Jargon

In a specialized field, I believe acronyms and "buzz words" have their place — but only if they're well understood by all. This month I'd like to cover some of the common terms that get tossed about in longwave circles and provide brief definitions for each.

The list is not meant to be all-inclusive, but rather a compilation of frequently used terms. If you can think of others you'd like to see, send them in and we'll get them into a future column. In alphabetical order, here they are:

Active Antenna—A very short receiving antenna that includes a high gain amplifier stage. They are often designed for outdoor mounting, but there are also several indoor models available. A good longwave type will have built-in filtering to eliminate AM broadcast overload.

DAID—Acronym for *Dash After Identification*. This is often used in beacon loggings to indicate that a long tone is sent following the Morse ID. This is common with maritime beacons and Canadian acro beacons. You may also see a variation on this theme such as DA31D, which means that there's a dash after three IDs.

DF—*Direction Finding*. Refers to the process of using a directional antenna to determine the direction of a transmitting station, such as an LF beacon.

ELF—Stands for *Extremely Low Frequency*. This refers to the radio frequency range below 300 Hz (that's right, *Hertz*). This is the band that the Navy uses to transmit to submarines. Forget any ideas of building a resonant antenna for this band — a half wave dipole at 30 Hz needs to be over 3000 miles long!

Ferrite Rod Antenna—Probably every household has one of these. It's that bar or rod inside your transistor AM radio with very fine wire wrapped around it. They make reasonably efficient, yet compact antennas for the low and medium frequencies.

GWEN—Acronym for the *Ground Wave Emergency Network*. GWEN data signals can be heard as raspy bursts of noise around 165 kHz. They are actually sending packet signals that could be used

by the Air Force to transmit critical information during a war.

LOWFER—Buzz word for *Low Frequency Experimental Radio station*. The FCC rules permit a one watt transmitter to be operated from 160 to 190 kHz without a license. A small but growing group of experimenters are using this band to communicate at distances of over 300 miles.

LF—*Low Frequency*. Refers to the radio frequencies from 30 to 300 kHz.

MEDFER—Stands for *Medium Frequency Experimental Radio station*. FCC rules permit a 100 milliwatt transmitter to be operated from 510 to 1705 kHz without a license. Many of the same people involved with LOWFER work are also active at the upper end of this band.

MCW—*Modulated Continuous Wave* (CW). This is the type of Morse transmission you hear from LF beacons. It's really just AM, modulated with a keyed tone rather than voice.

MF—*Medium Frequency*. Refers to the radio spectrum from 300 kHz to 3 MHz.

NAVAID—Acronym for a *Navigation Aid*, such as a radiobeacon, light, or buoy.

Negative Keying—A rare beacon problem where the transmitter's Morse ID comes out sounding like the opposite of what is actually being sent. This results in an "inverted image" where the spaces between characters become tones.

NDB—Stands for *Non-Directional Beacon*. This is the term applied to most LF aviation beacons. "Non-Directional" means that the transmitted signal is sent out from the antenna equally in all directions.

UNID—An abbreviation of *Unidentified*. It's often used in loggings to indicate a signal of unknown origin or purpose.

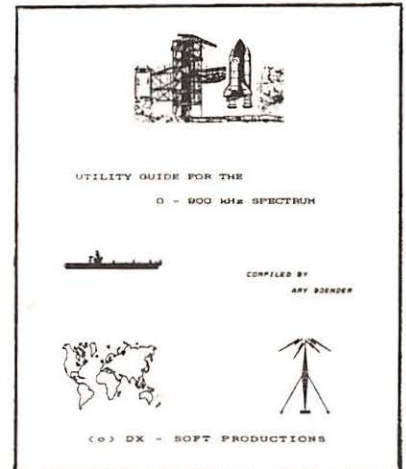
VLF—Short for *Very Low Frequency*. It refers to the radio spectrum from 3 to 30 kHz.

Contest Results

There was an excellent response to the LF trivia contest we ran in March. Here's a recap of the questions and the correct answers:

- 1) What is the authorized frequency range for US LOWFERS?
Answer: 160 to 190 kHz
- 2) List the two US agencies responsible for most LF beacons.
Answer: The FAA and the Coast Guard.

MONITORING TIMES



The Utility Guide for the 0-900 kHz Spectrum is a nice addition to any shack.

- 3) What does GWEN stand for?
Answer: Ground Wave Emergency Network
- 4) List two compact LF receiving antennas.
There were at least three acceptable answers: Loop Antenna, Ferrite Rod Antenna, Active Antenna.
- 5) List identifiers for any three Canadian beacons.
A few of the many possible answers: L (369 kHz)—Toronto, ONT; YDL (200 kHz)—Dease Lake, BC; YXL (405 kHz)—Sioux Lookout, ONT.

Congratulations go to **Todd Roberts** of Hilton Head Island, SC, and **Glenn Torres** of Reserve, LA, who were the winners drawn in the contest. Todd and Glenn have received complimentary copies of the *Utility Guide to the 0-900 kHz Spectrum*, compiled by European DXer Ary Boender. Also, any participant with a correct entry will receive a colorful wall certificate. Congratulations to all of you who participated.

If you're an LF utility enthusiast, you might want to add the *Utility Guide* to your bookshelf. This is not a detailed beacon directory, but rather a database-style printout of many utility users worldwide (mostly CW and FSK mode) such as the military, time stations, and so on. Ary Boender offers the *Guide* for \$8 surface mail, or \$10 air mail. To order, or to get more information, write him at: DX Soft Productions, Lobeliastraat 33B, 3202 HR Spykenisse, The Netherlands.

Next month, the emphasis will be on actual loggings from you — the readers. I'll try to compile a representative listing that includes the most frequently logged beacons from every part of the country. I'll also have some tips for getting the most out of your summertime listening. See you in July!

LF Tip of the Month

Keep some batteries handy for your LF receiver. When there's a local AC power outage, the LF band will seem like a whole new DXing paradise without all the usual manmade static.

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Journalism, Broadcasting, and The Boston Red Sox

Will the Boston Red Sox ever win a World Series? It may not be time to raise the championship flag over Fenway Park, but it is a banner year for Steve LeVeille. He's enjoying a triple play of happiness: writing news, reading it on the air, and being a devoted Red Sox fan. Steve's back in his hometown, and life couldn't be any better!

Millions of people all over the world now listen to Steve, who worked his way up through the ranks of local radio. His shift now begins around midnight in Boston, writing and producing hourly newscasts until just after 8 am. "When you're on the World Service, it's great! My first newscast is 2 am Boston time, but it's late night on the West Coast, it's morning in Europe and Africa, and it's evening prime time in Asia and The Pacific!"

In the wee hours of the night, only four people staff the Boston bureau of the World Service of the Christian Science Monitor: a news editor, an engineer, and another newscaster who broadcasts on the half hour. Together, they arrange coverage of stories from various correspondents and stringers around the world, and record and edit their reports for use on the air. The pace is often hectic!

Presenting news for worldwide audiences requires careful preparation. "I have to balance, but the tendency is to lean towards international stories and the biggest American stories." Short-wave broadcasting has brought new insight to Steve's reporting. "It's broadened my interests, certainly in geography. I'm interested in politics to the point where if you dropped me in the middle of some small town in Australia, I would start reading the local newspaper to learn about the town council meetings. Now it's my job to be looking this stuff up, and tell you about it, and I

can't think of a better job."

Steve's wife Diane is partially responsible for his move into international radio. "She bought a little radio for the kitchen at a yard sale. It was an old RCA plastic one from the 50s, and it had shortwave on it, too. I was picking up The Beeb, Moscow, and RCI. After a few months I had to get a better one. Early on, when they first went on the air, I listened to the World Service of *The Monitor*. I was thinking if I'm ever looking for a job again, I'm going to talk to these guys because I would love to be on shortwave radio." Steve got his wish.

LeVeille enjoyed an adventurous career before his first shortwave broadcast. Born in the Boston suburb of Medford, Steve attended nearby Emerson College. "So many people in the business were teaching classes there. I got hands-on experience at their station WERS, 88.9 FM. It was a great station then, and it's a great station now. It's number one on my presets!"

Talent and instinct have always fueled Steve's success. CBS Boston affiliate WEEI provided his first big break. "I started working there while I was still in college. I wrote the news for morning drive, and I also produced the sports show at night. It was a great start."

"I wanted to get on the air, so I worked at little stations in Southbridge, Massachusetts, and Geneva and Amsterdam, New York. I mostly did news, and eventually became news director at a couple of those stations. In 1980, I went down to ABC Radio Networks in New York City for an audition. I don't know what you had to do to pass it, but I didn't pass it." Steve's fate changed. ABC soon called back looking for people to cover their news room during the Democratic and Republican conventions. "I asked my boss in Amsterdam if I could schedule those weeks as my vacation, and he said no, so I quit!"

Christian Science Monitor World Services newscaster Steve LeVeille.



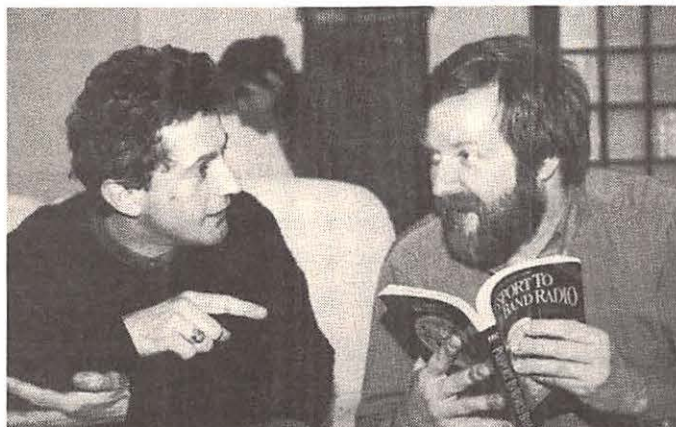
"My first day at ABC, Richard Queen, one of the hostages held in Iran at the time, was released because he had an illness. CBS Radio got a relative of his to talk to them, so they had audio on the story. ABC was going nuts trying to get some too. I suggested they call one of the former hostages because they would know something about him." Steve had a contact. He traced the former hostage to his current assignment at the US Embassy in Argentina, and interviewed him over the phone. ABC got the tape they needed. "And the rest is broadcast history!" chuckles Steve. "Nobody knew who I was, then all of a sudden, everybody knew who I was! I went for three weeks work and stayed for six years!"

Eventually, Steve and his wife wanted to return home to New England. A college friend of Steve's offered them a pair of jobs at "14-Q" WFTQ-AM in Worcester, Massachusetts. "I left ABC in October of '86. I moved after game one of the World Series which the Red Sox won at Shea Stadium; and we unloaded everything in Worcester just in time to watch game two which the Red Sox won in Shea Stadium. For The Red Sox, it was all down hill from there." They lost the series, but Steve was happy to be home.

January 15, 1991, is a day Steve and Diane will always remember. It was the deadline for Saddam Hussein to get his troops out of Kuwait; and the day everyone was fired at WFTQ. "The day after I was laid off, we read in the newspaper that WBZ was going to be a talk station for the duration of the war." WBZ's regular disk jockey were doing talk shows, and their evening talk show hosts were pulling very long shifts. "So, thinking, they might have fill-in disk jockey they don't have any fill-in talk show hosts."

Steve's intuition paid off. "I called that used to work with the program d

Steve LeVeille introduces Jean-Yves Richard of Toulouse, France, to short-wave radio. Steve DXes with a Sony SW-77.



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WBZ. I said 'Just get me lunch with this guy and I'll do the rest.' Well, I had lunch with the program director, and even though I had never done a talk show before, I walked out with an on-air audition." Steve hosted a talk show the next Saturday for five and a half hours.

"I didn't have any guests, so I just went in with some topics, ready for anything. It was good enough for them to just give me the gig. I did that for almost two years and I became their number one fill-in guy. It was really neat filling in for big guys like Norm Nathan, Peter Meade, and David Brudnoy, who I'd listened to forever."

LeVeille enjoyed the reach of WBZ's clear-channel signal. "The greatest kick of working there was getting calls from places like Kentucky and Virginia. A friend of mine was driving from Philadelphia to Pittsburgh and heard me! An old girlfriend of mine called the station from The Carolinas. Even during the day you'd get calls from Michigan or Upstate New York."

During his stay at WBZ, Steve was freelancing at public radio WBUR and at *The Monitor*. Life continued to improve: *The Monitor* hired Steve as a full-time anchor. Even WBZ can't match the reach of the World Service! Look for Steve LeVeille early weekday mornings on shortwave radio, or via your local American Public Radio affiliate. If you can't find him there, try the stands in Fenway Park!

Bits 'N' Pieces

Digital Radio is on the air across America! WILL-FM at The University of Illinois at Urbana is serving as the proving ground for Project Acorn's FM-compatible DAB system. The university was instrumental in developing the microchip technology making Acorn DAB possible. In the future, you'll enjoy CD quality sound via DAB, and station owners will save a fortune in utility bills. One hundred watts of digital FM will provide coverage equivalent to a 100,000 watt analog signal.

Acorn DAB for AM is equally impressive. If in-band compatible digital broadcasting is approved by the FCC, today's medium wave stations will enjoy a new lease on life. Digital AM produces full stereo sound with fidelity that rivals today's FM broadcasts. CBS-owned KNX-AM auditioned Acorn DAB while members of The Society of Broadcast Engineers listened and evaluated the results. A spare tower at the KNX transmitter site in Los Angeles was put to use for a 200 watt digital simulcast on 1660 kHz. KNX's analog signal on 1070 kHz sounded like a telephone call in comparison. Both AM and FM systems were first unveiled last September at The National Association of Broadcasters convention in New Orleans.

Internet global computer network and listen with the speaker built into your PC! Jump ahead to any segment of the presentation instantly, or change the order of the program elements to suit your interests. Carl's first show was called "Geek of the Week" featuring an interview with a prominent engineer. "Internet Talk Radio" hopes to eventually reach 75,000 to 150,000 listeners.

Mailbag

Stereo sounds different on KTUI-FM in Sullivan, Missouri. Two local high school basketball teams played crucial games on the same night. The station wanted to broadcast both games live, so they aired them simultaneously. The Sullivan Eagles' play-by-play could be heard in the left channel and the Bourbon Eagles' occupied the right channel. KTUI disk jockey Sam Scott explained the station did not want to favor one team over the other, so they devised this creative method to make every fan happy. Intense publicity preceded the event to prevent listener confusion. What did this sound like on a mono radio?! Radio authority David Alpert sent in these details as reported by The Associated Press.

International Bandscan

If your summer plans include a visit to Banff National Park in Western Alberta, bring a good radio! As you enjoy the beauty of Lake Louise, you'll find yourself far away from almost every broadcaster. Switch to FM and you might hear two signals: a very low power repeater of a Calgary FM station, CJAY; and if your radio can pick it up, the audio of Calgary's CTV outlet CFCN-TV Channel 5 rebroadcast on Channel 6. Look for it on 87.75 MHz, all the way to the left on your FM dial.

A sensitive receiver will bring in about ten AM stations, also from the Calgary area. Hang your long wire high in the trees or one of the many passing elk herds will pull it down! Local favorites include "Mix 1060" CFCN, featuring modern rock 'n' roll and "66 CFR" reviving the oldies you grew up with. Country fans will enjoy Q-91 CFDDQ and 960 CFAC.

Here's an excellent place for a DXpedition, because you won't find any local stations within a hundred miles of your cabin. Press the scan button in your rental car and it will never stop searching! And don't forget your camera! You'll want to bring the majesty of the Continental Divide and the Canadian Rockies home with you! Until next month, good listening and happy trails!

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1993 World Satellite Yearly

For years Baylin Publications has produced valuable reference books for the satellite industry. This year they are bringing out a totally new title. It's called the *1993 World Satellite Yearly* and is written by Dr. Frank Baylin, founder of Baylin Publications.

Dr. Baylin has to be one of the busiest if not the most prolific man in the satellite industry. He earned a Ph.D. in physics at the University of Pennsylvania and an MBA from the Wharton School of Business. In addition, he has worked in such diverse fields as biophysics and communications. At the Solar Energy Research Institute he was a Senior Scientist.

This scholarly background has helped earn Baylin Publications a reputation for thoroughness in the field of satellite communications. The *1993 World Satellite Yearly* lives up to that reputation.

Four Books in One

This 450-page, 8-1/2" x 11" book is conveniently divided into four sections which, on their own, would make handy reference books. The publisher has thoughtfully provided side tab markers to literally divide the book and make it a really useful reference tool.

These four sections are Technology, Video and Audio Programming, Satellites (technical data and footprint maps), and Companies (addresses and phone numbers for the world's satellite industry).

Technical

If this column has always left you hungry for more details about broadcast satellites, then the technical section alone is worth the price of the book. In 144 pages, Dr. Baylin inserts no fewer than 100 charts, maps, and diagrams to support the well written text. Here, at last, you'll find the answers to your satellite questions and dozens more you didn't think to ask.

In one small chart we can learn that the first Hughes Intelsat satellite was launched in 1965, had a design life of 1.5 years, had a total usable bandwidth of 50 MHz which could handle 480 voice channels. The Intelsat 600 launched in 1986 had a design life of 10 years, a usable bandwidth of 3.680 MHz which could carry 80,000 voice channels. That's just the beginning.

Mysteries Revealed

The mysteries of satellite technology are revealed in the *1993 World Satellite Yearly*. Here you'll learn how to read satellite footprint maps;

the actual frequency allocations for S, C, X, Ku, Ka and L bands in the Fixed, DBS, and Mobile satellite services; DBS orbital and channel assignments for the western hemisphere; the differences in signal polarity; and more.

Details of parabolic geometry, Cassegrain and off-set feeds and flat plate antennas are discussed in a manner understandable to all. In fact, every component used in the act of receiving satellite signals is thoroughly explained.

Understanding the mechanics of a TVRO installation and tracking the satellites in the Clarke Belt is fully covered in the Technology section. There's even a list of seven companies in the U.S. who manufacture inclined orbit controllers.

Broadcasting Formats

There are several broadcasting formats which are currently in use throughout the world and there are other formats which are looming on the horizon. Details of NTSC, PAL, SECAM as well as digital video compression and HDTV are explained in this section along with a non-technical discourse on scrambling and encryption. There is also found in this section a concise treatment of the Russian Statsionar system as well as frequency allocations charts for Arabsat, Hispasat, Jesat, Optus and Astra satellites.

Programming

The section on Programming runs 48 pages and is an excellent source for determining what's on each channel on any given satellite from Intelsat 508 at 180 degrees West all the way around the Earth to Intelsat 503 at 177 degrees West. Each listing gives the transponder number, actual frequency, dBw of the channel, EIRP power, whether or not the channel is spot beamed, and the video, audio and/or data on the channel. You'll find yourself referring to this section of the book over and over as you search the Clarke Belt for video, audio or data.

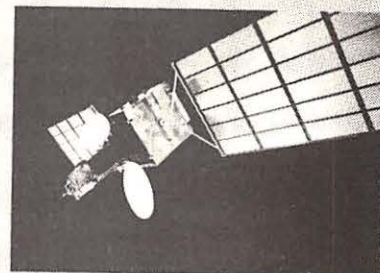
Satellites

The third section of this book contains the details of each of the spacecraft in geosynchronous orbit in the Clarke Belt. Each satellite is given at least two pages. The first page has the footprint map with all the various spot beams and power output contours as they fall on the Earth. The other page gives the background on the bird including its orbital location, operator, launch date, launch vehicle and present status.

Interesting data on the spacecraft itself is also

1993 WORLD SATELLITE YEARLY

by Dr. FRANK BAYLIN



presented. Stabilization, inclination, and telemetry beacon frequencies are among the items listed. The data page also details the number of transponders in each band, their bandwidth and polarization. Again, the book presents a wealth of information in a very concise manner.

Companies

The final section of the book lists the names, addresses and phone numbers of every satellite programmer in the world. Every spacecraft manufacturer is listed, as well as every company engaged in the manufacturing of transmitting and receiving equipment. And, finally, all the trade publications and their publishers are listed, too. This is truly a satellite encyclopedia!

Summary

The *1993 World Satellite Yearly* has a good number of advertisements tossed throughout the publication. In any other type of book I might object. But I've found that the ads in this type of reference book actually become reference points themselves and serve the reader well. There is also an extensive catalog of Baylin Publications and products in the back of this book which is also helpful to readers. I have recommended many of the books listed there in previous columns.

It's hard to find something wrong with a publication that is this well done. Indeed, the paper is thin enough to keep the weight down while being opaque enough to prevent bleed-through; the type is very easy on the eyes; and the perfect bound cover looks like it will take substantial abuse. The only thing this publication lacks is an index. The value of an index to someone needing to look up information quickly in a book this size cannot be exaggerated.

The Price is Right

I have refrained from divulging the retail price of this book because I wanted to save the best for last. The 1993 *World Satellite Yearly* is \$50 plus \$4 shipping in the U.S. That makes this book half the price of its only competitor and therefore one of the best bargains in all of satellite literature.

If you are interested in this or any of the other Baylin Publications write or call at the following: Baylin Publications, 1905 Mariposa, Boulder, CO 80302; phone (303) 449-4551; FAX (303) 939-8720. In the United Kingdom, write or call: Baylin Publications, 24 River Gardens, Purley, Reading RG8 8BX, U.K.; telephone/FAX: 44 (0)734-414468.

Transponder Notes

The BBC Nine O'Clock News has been seen for several months on Galaxy 2 variously on channels 13, 17 and 23 in the PAL format at 6:00 pm ET. It is apparently being beamed to Australia's ABC via Reuters from Tele-Cine, Ltd. It was last seen by this observer nearly a year ago when it was in the NTSC format on Westar 4. If you can put up with the elongated and black and white images resulting from our NTSC receivers trying to cope with PAL signals, this remains one of the best nightly news programs in the world. By the way, you'll have to adjust the vertical hold on your TV set to stop the rolling screen. If you do it just right it will lock in and not affect any of your NTSC channels.

Other international broadcasters of note: Radio Televisao Portuguesa (RTP) is found on Spacenet 3 channel 24. Caribbean Satellite Network is found on Galaxy 3 channel 7. TV Japan is found on Satcom C1 channel 17. SCOLA is now on ASC1 channel 23. All of the above are unscrambled.

Live network programming from Argentina, Chile and Peru is produced by Panamericana de Television and found on SUR on Spacenet 2 channel 22. It's scrambled via VCIH and available to subscribers independently. This satellite is also home to Telemundo (channel 9), USIA World Net (channel 3), and ECO/Galavision (channel 10), both of which are unscrambled. TDF 2 is a French network which feeds a daily news program on channel 1 of Galaxy 2. RAI Uno (Radiotelevisione Italiana), the national television service from Italy, feeds newscasts on channel 13 of the same satellite. Both are in the clear.

ASTA Pamphlet

The American Satellite Television Alliance has a pamphlet entitled "Satellite Dish Antenna Ownership" which they will send to you for free if you send a self-addressed stamped envelope.

It is designed to show the beleaguered dish owner that the law is on their side. If you're being harassed by a local municipality regarding your TVRO installation you need this information. Write: ASTA, 16 Broadway, Suite 400, Valhalla, NY 10595 or call (914) 997-8192 or FAX: (914) 948-6217.

Checkout Channel Checks Out

Turner Broadcasting System has pulled the plug on the Checkout Channel after two years of operation. According to a report in *Multichannel News* (2-22-93), TBS took a \$16 million loss. They had hoped to reach the 3,000 store level to make the channel pay and after two years had reached fewer than 900.

Buddy, Can You Spare \$80,000?

An ad in a recent trade publication quoted prices on renting a transponder on a non-cable C band bird. They were asking just under \$80,000 per month. Now you know why all those religious channels have the phone number on the screen at all times. And you thought you had trouble making car payments!

Digital Car Radio Via Satellite

A company called Digital Satellite Broadcasting Corp. has applied to the FCC to launch an S band satellite it would use to broadcast hundreds of digital radio channels to receivers in cars. Signals would be picked up on a six inch round, flat antenna. Cost for the hardware would be several hundred while subscriptions would run \$5 a month. In another report, sources say such schemes are five to ten years off. Much of the delay time could be caused by terrestrial interests' litigation.

Universal SCPC 300-C

Universal Electronics, Inc. has announced a new SCPC receiver designed for commercial applications. According to a press release, the SCPC 300-C will feature full readout of SCPC frequency, transponder, bandwidth, de-emphasis, companding and memory channel in use...displayed on an easy-to-read, super-twist LCD display on two lines with 30 characters per line. All companding boards — 3:1, 2:1, 1:1 — are built in and are standard features.

In addition, the new SCPC 300-C receiver has two high-quality, phase lock loop synthesized frequency converters to achieve stable reception. There are two outputs, a 600 ohm balanced line out and a 4-8 ohm speaker out, plus front panel headphone monitoring jack.

MT

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Tracking Amateur Satellites

Last month I discussed satellite communications and how to get started. Now that we know how to talk through the "birds," it might be a good idea to know where they are and when we can use them.

If you do not have a computer, it will be necessary to find a local ham who is active with satellite communications who can give you the required information. An alternative solution would be to simply monitor the beacon or downlink frequencies of the particular satellite you are interested in, and hope you are in the shack when it passes in range.

The ideal solution is to pick up a computer (IBM compatible preferred), and one of the many tracking programs that are available. These programs can predict when a particular bird will be accessible; others show the actual ground track of a given satellite (or several at the same time).

In the U.S., AMSAT (Radio Amateur Satellite Corporation) is the organization that builds and orbits the OSCARS. Sister amsat alliances in other countries likewise build and orbit amateur satellites. Close co-operation between the various groups reduces duplication of effort and assures a wide range of satellite types are available to the general amateur population worldwide.

Naturally, AMSAT offers its members a great deal of assistance in the form of tracking software, a computer bulletin board (land-line), technical help and a bi-monthly magazine *The AMSAT Journal*. So if you are interested in amateur satellites it would be in your best interest to join AMSAT. The address is: AMSAT, P.O. Box 27, Washington, D.C. 20044. Dues are \$30.00 per year in the U.S.A., \$36.00 in Canada and Mexico, and \$45.00 to the rest of the world.

One shareware program that will help you keep track of the various satellites is TRAKSAT. This easy and very inexpensive program can track six satellites simultaneously or provide an extremely accurate track of a given bird and tell you when your target is within range. It will also provide an orthoscopic view so you can see where

the target is in space with relation to your position.

To use the program, all you need do is load it on your IBM compatible computer and insert your latitude and longitude into the tracking station slot (a large list of cities is provided). Type in the closest city to your location, and when the ground track is shown on the map of the earth, your position will be directly under the crosshairs. The targets will be shown in relation to your location.

The next step is to obtain the latest set of Keplerian elements (mathematical description of a satellite's orbit). The Keplerian elements (or Keps) is available on your local packet BBS, AMSAT land-line BBS, and via the ARRLRTTY bulletin and the *AMSAT Journal*. If you obtain the Keps directly from your local PBBS, simply save them to disk and create a file for the TRAKSAT program (use a text editor to take out all non Keplerian data). Likewise, it is possible to use the printed Keps and create a file using your text editor (a text editor in a computer is a program that allows you to make changes to or create an ASCII file).

TRAKSAT is menu driven (it asks you what you want to do and lists options). I am assuming here that you have some basic computer knowledge. If you are a computer beginner, grab one of your ham buddies who knows the ropes, and ask him to give you a hand.

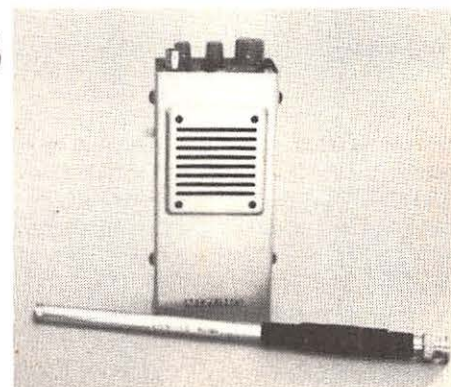
TRAKSAT is available from Renaissance Software and Development, Killen Plaza, Box 640, Killen, Alabama 35645. I recommend you request their catalog for full details. One program will cost about eight dollars with shipping and handling, but you may want to consider ordering some of their other programs since S&H is the same for one or several disks.

QRP Update

The April column discussed QRP (low power operation) and gave a few ideas on where to obtain equipment. I have received several requests for more info — so here goes.

j-Com (Box 194, Ben Lomond, CA 95005) has recently introduced a 2 watt output SSB transceiver (see photo). The unit is available for any one ham band from 80 to 6 meters and offers many features including RIT and VXO (50 kHz). At 1.5 x 2.5 x 6 inches, it's definitely a hand-talkie. One customer claims 106 countries worked on SSB. Cost is \$349.95 plus \$5.00 S&H.

Ryan Communications (Box 111E Camelot Rd., Portersville, PA 16051) is offering a completely built, crystal controlled transmitter board



j-Com's 2 watt SSB transceiver.

with 2 to 2-1/2 watts output, CW only, on any band from 160 to 15 meters. It does require mounting in a metal box which Ryan can provide for \$8.95 or dig up one of your own. Price of the transmitter runs from \$23.95 (15 meters) to \$34.95 (160 meters); send for list. Sounds like a bargain at the price. Crystals are obtainable from Ryan at \$5.95 (limited freqs available).

Oak Hills Research, 20879 Madison St, Big Rapids, MI 49307, offers a 20 or 40 meter transceiver kit for \$149.95 plus \$4.50 S&H. This kit features a superhet receiver, VFO, RIT Crystal filter and 3 watts of power. The kit is complete with nothing else to buy (power supply or batteries required). Oak Hills has an excellent reputation! If you are looking for a kit project, this may be it.

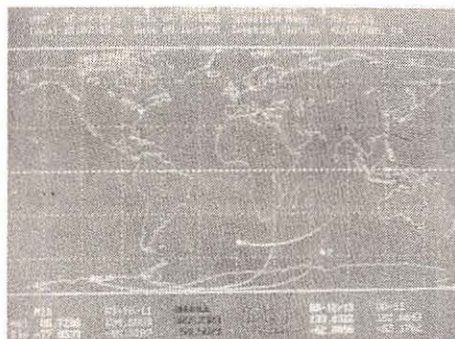
For the homebrew enthusiast, parts are obtainable from the following sources:

- Mouser Electronics, 2401 Hwy 287 North, Mansfield, TX 76063.
- Digi-Key, 701 Brooks Ave. South, P.O. Box 677, Thief River Falls, MN 56701
- Fair Radio Sales, P.O. Box 1105, Lima, Ohio, 45802.
- BCD Electronics, P.O. Box 450207, Garland, TX, 74045
- Circuit Specialists, P.O. Box 3047, Scottsdale, AZ 85271.
- Amidon Associates, 2216 East Gladwick St., Dominguez Hills, CA 90220.

All of the above publish catalogs; mention *MT* when you write for them and then keep them handy so you can find the parts for that next project. Admittedly, this is not a complete listing, but it should be enough to get you headed in the proper direction.

Special Event Station

E.F. Johnson (early manufacturer of ham transmitters) is celebrating its 70th Anniversary with a special event station. The call 9ALD has been requested, but it is unknown at this time if the FCC will issue the call for the event period.



Tracking multiple satellites (six).

Rob Leonard's Ham DX Tips

June is usually a warm, lazy month. A month which most people tend to relax, and one way to relax is to DX. I hope these tips will help you do just that.

BOSNIA-HERCEGOVINA Those who have been following news reports from here know that amateurs located here have been passing information on to the rest of the world about the war. One of those stations has been 4N4EAM. Most of these communications have been taking place during local darkness hours with other European amateurs on frequencies between 3650 and 3750 kHz SSB and 7040 and 7080 kHz SSB. 4N4XX recently reported that this country will soon change its identifying prefix from 4N to T9. **BURKINA-FASO** XT2BW meets with his QSL manager WB2YQH (Robert Nadolny, 135 Wetherstone Dr., West Seneca, NY 14224-2540) every Sunday at 2100 UTC on 14210 kHz SSB. **CANADA** Mary Lou Brown, NM7N, writes that she and Alice King will be operating from Sept-Iles Quebec July 4th to 9th. It is located in that part of the province which is located in Zone 2, and these fine ladies will be offering that rare zone to those needing it for the Worked All Zone award on all bands RTTY, SSB and CW. Both will amend their own call signs as "VE2." Mary Lou says a QSL route will be announced during the operation. **CZECHOSLOVAKIA** As I am sure most of you know, this central European country peacefully separated into two new countries, the Czech (prefix OK) and Slovak (OM prefix) Republics. If you are counting countries, contacts made after 1 January 1993 will be counted as the two new countries; contacts on or before 31 December 1992 count as the old Czechoslovakia. **DODECANESE** SV5BXM can be logged on 14085 kHz RTTY at 1730 UTC. He says he has been experiencing mail problems and should be announcing a new QSL route soon. **FEDERATED STATE OF MICRONESIA** Mary Fox, V63MF, will be here for the next two years. You can log her on the IOTA (Islands On The Air) frequency of 14260 kHz SSB daily at 2000 UTC. Send your QSL requests to her manager: KD1F, Emil Tilon, 19 Dorchester Dr., Farmingville, NY 11738. **NEW CALEDONIA** FK8GM has been appearing daily on 7230 kHz starting at 1000 UTC. Send your QSLs to his manager Richard A. Kashdin, 136 Westcliff Dr., West Seneca, NY 14224. **ST. PIERRE AND MIQUELON ISLANDS** Several female amateurs will be operating from these two islands, which are all that remain of France's North American Colonies and Canadian holdings from the 1700's. They are located just off the coast of Southern Newfoundland. Using their own call signs amended /FP (the prefix here) will be Mary Lou Brown, NM7N, and Alice King, N4DDK, who later will be operating from Zone two in Quebec (see Canada above for details). They will be joined by VE7YL, Elizabeth Anderson, and Nelie Saitel de Lazard, XE1IC. They will operate four separate stations on all bands CW, SSB, RTTY. Mary Lou says a QSL route will be announced during the operation. **SURINAM** PZ2AC has been logged on 14085 kHz RTTY at 0200 UTC. His QSL manager is: WA4JTK, Alan Strauss, 17401 NW 47 Ave., Carol City, FL 33055. **SYRIA** OH3MIG/SY, a member of the UN peace keeping force in the Golan Heights, can be found operating on 21035 kHz CW at 1800 UTC. He asks that you QSL to his manager: OH3GZ, Jukka Korvanen, Varuskunta 47 as 11, SF-11310 Riihimäki 31, Finland. **TANZANIA** 5H3MT (QSL to M Gari Taguchi, JA3PAU, Box 1052, Kobe 650-91, Japan) is another DX target for 12 meter DXers: check 24950 kHz SSB at 1730 UTC. **TFYROM** The Former Yugoslav Republic Of Macedonia was recently admitted to the United Nations under this name, because Greece objects to its using the name Macedonia. This is the newest addition to the DXCC countries list! Look for stations using the prefixes of 4N5 or YU5. Amateurs who already have contacts with such stations on 8 September 1991 or afterward may claim DXCC credit by submitting those QSLs to the ARRL. Also look for an upcoming official name change for this country as soon as the UN and TFYROM can settle on one. A prefix change may not be far behind as well. **USA** Yours truly will be active as part of the N9LAG and N9BJG contest team during the ARRL June VHF QSO party June 12th through 14th. We will be active using one of these two call signs (it has not been decided which one yet) on 50 MHz, 144 and 432 MHz SSB. If you log one of these two call signs, you can obtain a QSL via: P.O. Box 91, Benton, IL 62812. Hope to receive reports from you...

73 de Rob.

In any case, the station will operate under the call WA0CJU. Operation will be on all bands from 160 to 10 meters on June 18-20 and June 25-26 (Field Day weekend). A special QSL and Certificate are available for two way contacts. Send an 8 x 11 SASE for the certificate and letter size SASE for QSL to E.F. Johnson Co., ATTN: 70th

Anniversary Special Event Station, PO Box 1249, Waseca, MN 56093. For full info on the event call (507) 835-6612 (open 24hrs a day).

That's all for June; see ya in VHF Sweepstakes and on Field Day. 73 de N3IK, Ike

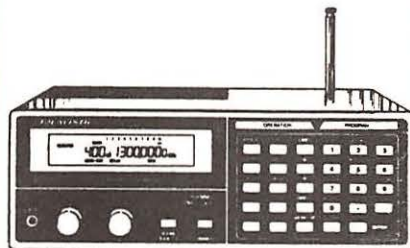
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The Crowd on 41 Meters

The high end of the 41 meter band has been the prime frequency range used by North American pirate stations for more than a decade. "Outer Limits" reporters regularly find that the area about 40 kHz above and below 7415 kHz is used by the vast majority of pirate transmitters. Most of these programs are noted on weekend evenings. The frequency range was not used heavily by broadcasters or utility stations ten years ago, so pirates moved into the vacant band space.

This band has changed significantly during the 1990's. Quite a few international broadcasters, many of which transmit from the United States, are now heard here on a daily basis. The latest entrant is **WEWN**, the new Catholic station in Birmingham, Alabama. Its strong signal blasts forth every evening on 7425 kHz, which was a prime pirate frequency during the 1980's.

The rest of 41 meters is now chock full of licensed broadcasters. A partial list includes **WRNO** on 7355 kHz, **Radio for Peace International** on 7375 and 7385 kHz, **WSHB** and **WRNO** on 7395 kHz, the **Voice of America** on 7405 kHz, **WWCR** on 7435 kHz, **WJCR** on 7490 kHz, etc. Most of these stations generate very strong signals that can overload the front ends of many consumer portable and communications receivers, creating slop interference over a wide portion of the band.

The situation is squeezing pirate activity into smaller and smaller portions of 41 meters. The pirates are still there. You just have to tune around a little bit in search of a vacant spot where a pirate can avoid the big boys. We probably can expect increased pirate activity in alternative frequency ranges such as 6200-6300 and 6800-6990 kHz.

It's Ironic

The new **WEWN** frequency has raised a few eyebrows. The FCC busted a few pirates that used 7425 kHz during the 1980's. At that time, FCC press releases routinely said that pirates using 7425 kHz were creating "harmful interference" to licensed transmitters. This logic curiously does not seem to apply to the new powerful **WEWN** service.

MT readers have already noticed interference from the **WEWN** transmitter on 41 meters. John Carlson of Littleton, MA, regularly hears a longstanding strong Spanish numbers transmitter on 7422.5 kHz in the evening. The spies may have to find a new frequency, since **WEWN** now wipes them out.

Another nearby licensed utility station is the **TELAM** Spanish language press RTTY service (425/50), which has been using 7428.5 kHz for years to transmit its evening wire stories. I heard an early **WEWN** test on 7425 kHz with hours of

interval signals on April 10. This pretty much wiped out the RTTY signal from Buenos Aires, although the utility was still audible as weak interference to **WEWN**.

What can we conclude? Pirates on 7425 kHz are harmful, but powerful international broadcasters on this technically "out of band" channel are OK. This at least is ironic. Some might feel that the situation is hypocritical. What do you think?

USA Right Wing Clandestine QSL's

Last month we reported that two right wing English language semi-clandestine broadcasters have started to verify reception reports. This month we have the visual evidence. Greg Martin's QSL #3 from **CCC Radio** is pictured here. An enclosed letter indicates that the verification signer on this voice of the Ku Klux Klan is Tim Harper (not Tim Hurper as previously reported). They claim an output power of 500 watts from a Yaesu FT-100-B transmitter. The station address of P.O. Box 5635, Longview, TX 75608 has again been confirmed.

MT reader Michael Goetsch of Pittsburgh, PA, joins the list of DXers who recently found QSLs in the mailbox from the "American Dissident Voices" program of **National Vanguard Radio**. I also picked up one of these for a reception report that was mailed almost a year ago. The station has been responding to its pile of old correspondence. As you see here, the QSL features a picture of station announcer and Producer Kevin Alfred Strom.

During summer Daylight Time months, Vanguard is scheduled via **WRNO** at 0100 UTC Sundays on 7355 kHz. The station QSL lists both an address of P.O. Box 90, Hillsboro, WV 24946 and a telephone number of (304)653-4600.

American Dissident Voices



Verification of Reception:

To GEORGE ZELLER

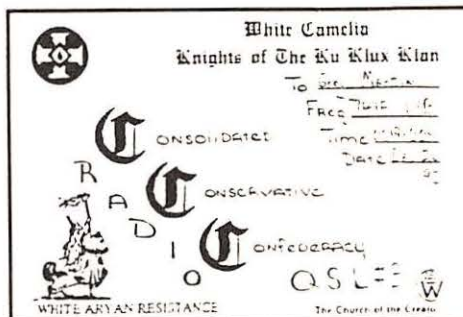
Date 5-10-92 Time 0115

Frequency 7355

Transmitter WRNO

Kevin Alfred Strom

Strom's photo on the Vanguard QSL.



Greg Martin's QSL from CCC Radio.

Korean Clandestine

New reports that North Korea has developed a nuclear weapons capability have surfaced in the press. Thus, Korea continues to be a political hot spot. Regular **MT** reporter Rob Ross of London, Ontario, reminds us that the **Voice of National Salvation** can still be heard on this side of the Pacific. This anti-South Korea operation obviously is financed by North Korea. Rob had a very good signal from them on 4450 kHz at 1000 UTC. He noted parallel channels of 4119 and 3481 kHz, but says that all three frequencies are jammed. It's a sure bet that South Korea finances the jammers. The best time to look for the clandestine is around your local sunrise.

Radio Caroline

In the May **MT** we mentioned the reactivation of the famous Europirate **Radio Caroline** on shortwave. Rob Ross confirms that their signal sometimes is audible in North America, even early in the evening. He heard them this spring on 6295 kHz at 0015 UTC. Since sunset times are now getting later, you might want to try for them at least an hour or two after this. The most consistent reception comes on the weekend.

What We Are Hearing

Exactly one year ago I started a new North American pirate logging format in the "Outer Limits." I asked for reader comments, and I received literally dozens of letters. The verdict has been unanimous. Everybody seems to find that our alphabetical list of stations is a useful feature. As a result, the pirate loggings section of the column has moved out of the experimental stage. As you see again this month, pirate activity continues at a very high level by historical standards.

Most pirate stations welcome correspondence and reception reports, as long as you enclose three first class stamps with your letter. Foreign addresses are an exception; they will need \$1 US within your envelope. Addresses used by stations reported here include P.O. Box 452, Wellsville, NY 14895; P.O. Box 109, Blue Ridge Summit, PA 17214; P.O. Box 605, Huntsville, AL 35804; P.O. Box 493, Boys Town, NE 68010; P.O. Box 293, Merlin, Ontario N0P 1W0; and P.O. Box 220342, 5600 Wuppertal 22, Germany.

Action Radio- 7415 at 0115. A. J. Michaels mainly plays rock music, but he regularly discusses current issues in the pirate radio scene. Addr: Boys Town. (Pat Murphy, Chesapeake, VA; Alan Masyga, Winona, MN)

Big Weenie Radio- 7415 at 0500. Few DXers heard this station's first transmission last November, but they inform us that they are QSL'ing to the lucky few that logged them. Addr: None yet, but verifies loggings in ACE. (Direct from the station)

CSIC- 7413 at 0230. Pirate Rambo is still the most active Canadian pirate. His big signal features both his own programming with a "Psycho Chicken" interval signal and regular relays of other unlicensed broadcasters. Addr: Merlin for Canadians; Blue Ridge Summit for USA residents. (Norm Alexander, Diamond Springs, CA; Masyga)

Hello Radio- 7415 at 0000. Alan continues to regularly hear this pointless pirate jammer. Addr: None. (Masyga)

He Man Radio- 7415 at 1445. He Man broadcasts primarily in the evening, but he surfaced in the morning from an announced location atop a hill in Ohio. He has promised "kinder and gentler" shows in the future, since the *Signals DX* program has left the air. Addr: Blue Ridge Summit. (Ron Bruckman, Hempstead, MD; Peter Veniet, Zeeland, MI; Ross, Masyga)

Hit Parade Radio- 7415 at 2300. The station name accurately describes its programming, which consists of 1960's rock hit music. Addr: Wellsville. (Masyga, Venlet, Ross)

KMCR- 7415 at 0315. Magic Mike and Wanda of Magic Carpet Radio are still best heard in the western USA. An amusing recent touch was a dog who barked the K-M-C-R identification in CW Morse code. Addr: Blue Ridge Summit, but not verifying much lately. (Alexander and direct from the station)

KNRM- 7415 at 0230. The "K-Norm" slogan on this new one does not refer to Norm of the "Cheers" TV show. It instead plays tapes of General Norman Schwartzkopf's book. Addr: None. (Doug Merkel, St. Louis, MO)

Radio Airplane- 7415 at 0245. Pirate Captain Eddy's new QSL shows a "FCC Fighter" jet instead of a small Piper Cub plane. This one was Pete's first pirate, and they verified! Addr: Wellsville. (Venlet; Skip Harwood, Beale AFB, CA; Danny Roberts, Slaton, TX via Gigi Lytle, Lubbock, TX)

Radio Anarchy- 7418 at 0130. Skip says that one of their recent shows included a strange mix of Brazilian music and Belgian punk rock. Addr: Blue Ridge Summit. (Harwood)

Radio Beaver- 7415 at 0045. Bucky Beaver's popular rock station can often be identified by its theme song, which is music from the old "Leave it to Beaver" TV show. Addr: Merlin. (Ross, Masyga)

Radio Free East Coast- 7418 at 0045. Also known as **WREC**, they mix rock music with genuine commercial radio ads. Much Warner Brothers cartoon audio works its way into the programs. Addr: Wellsville. (Murphy)

Radio Marabu International- 7412 at 2245. Pat found that this rock station has joined the growing roster of Europirates who occasionally are relayed by North American pirate transmitters. DJ Pat Shaffer spins the tunes. Rob Ross reports a QSL from them for a broadcast via their normal Northern Ireland Relay Service European transmitter. Addr: Wuppertal. (Murphy, Ross)

Radio Morania- 7417 at 0100. This classic parody of pre-Glasnost Soviet bloc broadcasters reappears occasionally. Originally marketed by an electronics magazine, its funniest segment interviews workers in the chocolate mines. Addr: Currently none. (John Trimmer, Baltimore, MD; Alexander; Murphy; Masyga)

Radio USA- 14430 at 2200. Mr. Blue Sky and Joe King have been using 7425, 21500, and a variety of frequencies such as this one for their well produced shows of comedy and punk rock. Addr: Wellsville. (Venlet, Masyga)

Secret Mountain Laboratory- 7416 at 0045. The format on this veteran station has been consistent for nine years. Their male announcer combines folk music and relays of other pirates, allegedly from a transmitter in Hilo, Hawaii. Addr: Wellsville. (George Zeller, Cleveland, OH)

URGZ- 15050 at 2300. This new station features country and novelty music hosted by an announcer with a falsetto voice, but its signal has been weak. Addr: Unknown so far. (Bud Stacey, Satsuma, AL; Ross)

Voice of Oz- 7418 at 2345. Howard E. Lyon has resurfaced with news, weather, sports, ad parodies, and classic rock from Oz. He sometimes ID's as Radio Free Oz or RTV Oz. Addr: For nonresidents of Oz, Wellsville. (Kathy Zylka, North Tonawanda, NY; Trimmer; Masyga)

WEED- 7415 at 0600. Their slick productions combine rock and humorous drug advocacy sketches. Addr: Still none. (Ross)

WKIK- 7420 at 0145. The upper sideband transmitter of this Jacksonville, FL, rocker suffers from a bad frequency drift, creating very annoying audio and poor modulation. Addr: Wellsville announced, but not verifying yet. (Harwood, Masyga)

WLIS- 7413 at 2300. Jack Boggin plays interval signals from licensed international broadcasters. His third anniversary show featured a cameo by Bucky Beaver of Radio Beaver. Addr: Blue Ridge Summit. (Masyga)

WRAR- 7417 at 2245. Rob reports a poor signal but a fairly positive ID from this rock station. Addr: Huntsville. (Ross)

WRV- 7416 at 0230. Pirate Pete plays rock music, using a slogan of "The Radio Virus." His distasteful claim of an "HIV positive" QSL is fortunately just a joke. Addr: Wellsville. (Murphy, Ross)

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This new quarterly column by various authors will focus on how to find particular topics of shortwave programming. This month's article on programming for and by women is written by Ron Tamburello, author of the November '92 feature on DX programs.

International Broadcasts for Women

The dorsal-posterior aspect of the typically male shortwave listening enthusiast is the perspective most familiar to his proverbial "better half" as he sits in his radio room. And it follows that few of these otherwise understanding ladies fathom how anyone could get any enjoyment by filling one's head with noise and static for hour after endless hour.

Well, ladies, why not reserve some radio time to see what is out there, and why not start with some programming that is oriented to your interests? There are several international broadcasters that produce programs by and about women that cover a broad array of topics from politics to the environment, and many other issues focusing on women in modern society. (Gentlemen, read on. You might find it somewhat difficult to pry her away from the radio as well...)

Radio for Peace International

Always the innovator, Radio for Peace International, located in Ciudad Colon, Costa Rica, has

two regular programs of interest to women. The subject matter of these broadcasts touches the leading edge of women's rights and place in the social order, and can be somewhat... well, gripping. Hold on to your hats!

The first is the program *WINGS*, a "Women's International News Gathering Service," that is aired weekly on Thursday at 2030 UTC (repeated on Friday at 0430 UTC). The repeat broadcast is the best bet for listeners on the West Coast of North America.

This half-hour program of women's news and current affairs consists of a series of newscasts, interviews and documentaries, touching on matters affecting women across the globe. A recent report profiled the closing of U.S. military bases in the Philippines, and the effects it will likely have on Philippine women and their fatherless, American-Asian children.

Another RFPI production is a daily one hour program entitled *FIRE* (Feminist International Radio Endeavor), which is billed as a "Women's Radio Magazine." These programs are written and

hosted by women, and cover a broad range of topics including such issues as poverty, discrimination, the environment, education and culture, all from a gender perspective. The producers of this international women's forum cite as their objective the strengthening of the consciousness of women across the traditional barriers of nationality, race, culture and language.

Although the focus is on women in the international community, it is interesting to note that the issues affecting women in the Latin American countries are surprisingly similar to those in the United States, as well as in other English speaking countries. Listen daily on one or more of RFPI's standard frequencies as listed in the "Shortwave Guide" at 1700 UTC, and repeated later in the day (in North America) at 0100 UTC. The program is also broadcast in Spanish one hour earlier.

Radio Australia

Radio Australia is another station that can always be depended upon for carefully thought out and well executed programming, and their offering on women's affairs is no exception. *Pacific Women* airs on Saturday at 0313 UTC (after the news) as part of the *Pacific Beat* program on the Pacific Evening Service. The primary audience for this program is Asia and the island nations in the southern hemisphere, including much of the Micronesian and Melanesian area of the Pacific basin. Here the cultural uniqueness of women is more apparent, but their daily trials and tribulations are nonetheless reminiscent of those of women elsewhere in the world.

A recent broadcast focused on the effects regional culture and colonialism has had on women in certain Pacific island nations. Although the lives of women here are deeply rooted in centuries of tradition, the global influence of Western society has had its impact, and the resulting and inevitable parallels to the lives of women in the West are shockingly apparent. I find *Pacific Women* to be most interesting and informative! (When listening for this program, do not be confused by Radio Australia's broadcast of live sports events on *Sportsworld* to other areas in the region at this same hour on some frequencies.)



Members of the production team prepare an edition of *FIRE*.

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- ☆ Distance between locations.
- ☆ Short and Long True Bearings.
- ☆ Current Universal and Local Day, Date and Times.

Location: Map Graph Info Quick Reference Database Exit

From Location: Los Angeles, California, United States
 City: Los Angeles, CA
 Lat/Lon: 34°03'N - 118°14'W
 Time Zone: PST-0800
 Daylight Saving: No
 Sunrise: 06:32
 Sunset: 05:17
 True Bearing: 275°

To Location: New York, New York, United States
 City: New York, NY
 Lat/Lon: 40°42'N - 74°00'W
 Time Zone: EST-0500
 Daylight Saving: Yes
 Sunrise: 06:29
 Sunset: 07:56
 True Bearing: 275°

Short Path Distance: 2,443 Statute Miles, 3,932 Kilometers, 2,123 Nautical Miles

Universal Time: 08:22:36
 Local Time: 07:14:00

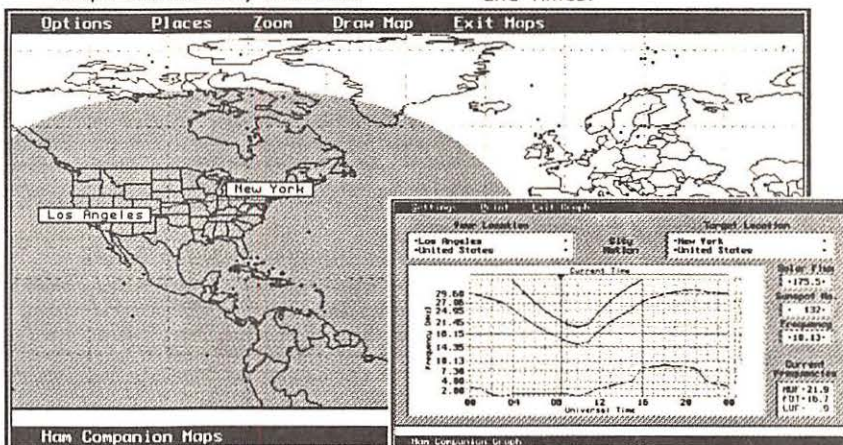
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Although the BBC does not at present have a series on women's issues, many of their plays, programs and profiles focus on items of interest to women. For example, you may just have time to catch "I Leave Without Malice" — the story of Milada Horakova, a Czechoslovakian woman who displayed remarkable courage during World War II. It airs Sunday May 30 at 0230 UTC with repeats at 1615 and Monday at 0730 UTC.

Radio Moscow may also have initiated a regular new feature about women. Jim Frimmel reported on the GENIE computer network having heard a program entitled *Great Women of Russia*. This report is so recent I have not had time to verify whether this is a continuing program...but you can. Listen to Radio Moscow at 0311 UTC on Mondays to see if you catch it.

China Radio International

On a lighter side and not for women alone, is something for your palate (listen-up guys, I know there are many of you who are good cooks). One of several programs on preparing exquisite dishes is China Radio International's (formerly Radio Beijing) *Cooking Show* which airs on Sunday at approximately 25 minutes past the hour on the

0000, 0300, and 0400 UTC broadcasts (Saturday afternoon and evening in North America). You will be treated with recipes and instructions for the preparation of some of China's finest cuisine.



FIRE goes on the air.

Another weekly program on food and cooking is produced by **Radio Australia** and can be heard on Friday at 0330 UTC (after the news). It delves into some of the more common dishes that are found "down under." Guys, now all you have to do is get her away from the radio long enough to enjoy the meal...

These programs are a mere sampling of what can be heard on the international airwaves. During your idle time waiting for your favorite program, tune around... you might be surprised and quite pleased with some of the broadcasts that you will find. Good luck, and here's to your radio listening enjoyment!

MT

If you have specialized in an area of listening you would like to present to MT readers, please contact the managing editor with your proposal.

Budget Cuts

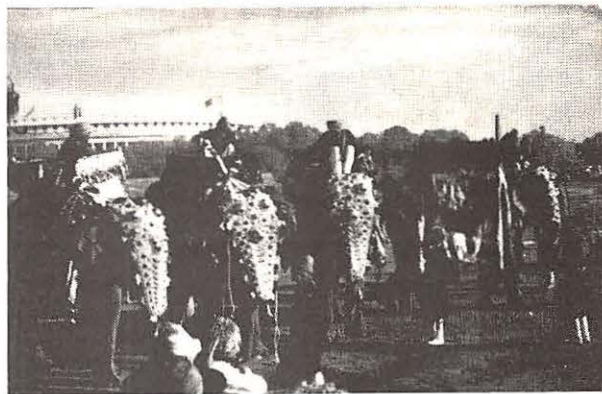
Now there's a word that's become synonymous with shortwave stations! Unfortunately, that usually means a cut in QSLing, but hold on, we have good news to report from the Voice of America. John Vodenik of the Bethany relay site, informs us that the station has taken action to improve their verification system, and provide direct contact points for listener reception reports.

The VOA address is, c/o Janice Davis, 330 Independence Avenue SW, Room 1547, Washington, DC 20547. Overseas reports can be mailed to this address to the attention of Irene Greene.

If you hear the Bethany VOA relay, John has an impressive record of verifying direct reports. Send your report to: VOA-Bethany Relay Station, P.O. Box 227, Mason, OH 45040.

Still struggling to verify the new Russian stations cropping up almost daily? It's no secret that the majority of the stations in the former USSR verify reports in Russian only, which presents a problem for many listeners. According to DXer Stanislav Mekhonoshin, "If you don't speak Russian, or know the address of a station, we will translate it and send it to the station." Send your U.S. dollar to the new QSL office, c/o RM, P.O. Box 1461, Perm 614036 Russia/C.I.S. Now is the time to track down those independents, commercial and pirate stations!

The elephants on this All India Radio QSL are all dressed up and ready to go. Submitted by Ray Labrie of Portsmouth New Hampshire.



card unsigned. Received in two months for an English report, mint Malta stamps, and one U.S. dollar. Station address: P.O. Box 143, Valletta CMR 01 Malta. (Ed Rausch, Cedar Grove, NJ) (Mikell Goetsch, Pittsburgh, PA)

MARINE COASTAL STATIONS

Boca Radio-LSA, 13057 kHz. Full data prepared QSL card and letter verified by Sr. Ramon Francisco Perez-Jefe Estacion Costera LSA. Received in 27 days via registered mail for a Spanish utility report and 2 IRCs. Station address: c/o Empresa Lineas Maritimas Argentinas, Corrientes 389, 1327 Buenos Aires, Argentina. (Mike Hardester, Jacksonville, NC)

San Francisco Radio-KPH, 6320 kHz. Full data letter verified by Mike Walsh. Received in 9 days for an English utility report, U.S. mint stamps and an address label (used). Station address: MCI International Inc., 17400 Sir Francis Drake Blvd., Point Reyes, CA 94956. (Hardester, NC)

PAPUA NEW GUINEA

NBC, 4890 kHz. Full data station logo card, verified by Moses Nghal-Station Engineer. Received in one month for an English report, and mint PNG stamps (used on return mail). Station address: Nat'l Broadcasting Commission of PNG, P.O. Box 1359, Boroko, Papua New Guinea. (Rausch, NJ)

SHIP TRAFFIC

USS ACADIA, 14441.5 kHz-NNOCWX. Full data prepared QSL card unsigned. Ship photo included. Received in 21 days for an English report. Ship address: USNAVMASSRADSTA NNNOCWX, USS Acadia (AD-42), FPO San Francisco, CA 96647-2530. (Timothy Starr, Swansea, SC)

GOLDEN FLEECE-ELEY9, 500 kHz. (Tanker) Full data QSL letter verified by ship Radio Officer. Received in 41 days for an English utility report and one U.S. dollar. Ship address: c/o E.B. Communications (Great Britain) Ltd., 20 Imperial Way, Croydon CRO 4RR, Great Britain. (Hank Holbrook, Dunkirk, MD)

ST. HELENA

Radio St. Helena, 11092.5 kHz. Full data 25th Anniversary card verified by Tony Leo. Station promotional literature included. Received in three months for an English report and mint St. Helena stamps. Station address: Broadway House, Jamestown, Island of St. Helena, South Atlantic Ocean. (Stephen Leite, Fall River, MA) (Rausch, NJ) (Price, PA) (Harold Frodge, Midland, MD) (Lloyd Van Horn, NC) (Holbrook, MD)

SWITZERLAND

Red Cross Broadcasting Service, 6135 kHz. Full data station card, unsigned. Station brochures and tourist

literature included. Received in 27 days for an English report, 1 IRC and souvenir postcard. Station broadcast: Dept. of Communication ICRC/CICR, 19 Avenue de la Paix, CH-1202 Geneva, Switzerland. (Stephen Hunter, Drexel Hill, PA) This station's only broadcast to North America is on the last Thursday of every month. (GVH)

TIBET

PBS-Xizang, 5240 kHz. Full data card, unsigned. Received in one month for an English report. Station address: CPBS, Box 4501, Beijing, China. (Price, PA) Nice to see CPBS continues to verify regional reports. (GVH)

UNITED ARAB EMIRATES

UAE Radio-Abu Dhabi, 9605 kHz. Full data QSL form letter/schedule verified by Station Director. Received in 44 days for a souvenir postcard. Station address: Ministry of Information & Culture, P.O. Box 63, Abu Dhabi, United Arab Emirates. (LeRoy Long, Edmond, OK)

UNITED STATES

WFLA 25780-FM. Date/frequency logo card and letter signed by Wilson Welch-Chief Engineer. Received in 11 days for an English report. Station address: 801 Jackson St., Tampa, FL 33602. (Charlie Washburn, Robbinston, ME)

KJES (King Jesus Eternal Savior), 11715 kHz. Full data post office postcard returned verified by Station Manager. Received in 10 days for a US mint stamp (not used). Station address: KJES, The Lord's Ranch, Mesquite, NM 88048. (Hardester, NC) (Frodge, MI)

WEWN, 7520/9825/18930 kHz. Full data 'Angel & Compass' card, signed by William Steltemeier-President. Received in 78 days for an English report and US mint stamps. Station address: P.O. Box 100234, Birmingham, AL 35210. Additional address: 5817 Old Leeds Rd., Irondale, AL 35210. (Washburn, ME) (Hardester, NC)

NOR-USCG Air Station San Diego, 5696 kHz. Full data prepared QSL card verified by M.A. LoBasso-RM3, and stamped with station's seal. Received in 18 days for an English utility report and a SASE. Station address: 2710 North Harbor Dr., San Diego, CA 92101-1079. (Russ Hill, Oak Park, MI)

US PIRATE

Radio Azteca, 7415 kHz. Full data QSL card, verified by initials "B.S." (Bram Stoker). Station pennant included. Received in 23 days for an English report and three US mint stamps. Station address: P.O. Box 452, Wellsville, NY 14895. (Doug Merkel, St. Louis, MO)

EUROPIRATE

Weekend Music Radio-The Voice of Scotland, 15043 kHz. Full data QSL card, bumper stickers, business card, and a personal letter from Jack Russel. Received in 87 days for an English report. New mailing address: c/o WMR, 14 Stone Row, Coleraine, Co. Londonderry BT52 1EP, Northern Ireland. Letter states a possible future broadcast on 3920 kHz, running 400 watts from a homebrewed transmitter. (Al Underwood, Silver Springs, NY) Thanks, Al, we don't see this pirate reported often. (GVH)

INDIA

AIR (All India Radio), 11620 kHz via Bangalore. Full data QSL card, with illegible signature. Received in 42 days for an English report. Station address: Parliament Str, Post Box 500, New Delhi, India 110001. (Michael Mc Ferrin, Brights Grove, Ontario, Canada)

KIRIBATI

Radio Kiribati, 17440 kHz. Full data QSL scenery card, verified by Engineer-in-Charge. Received in one month for an English report, mint Kiribati stamps, one U.S. dollar, and souvenir postcard. Station address: P.O. Box 78, Bairiki, Tarawa Atoll, Republic of Kiribati, (David A. Norcross, Barrigada, Guam)

MALAWI

MBC, 3380 kHz. Full data QSL letter, signed by P. Chinsu. Received in 3 months for a taped report, and one U.S. dollar. Station address: P.O. Box 30133, Blantyre 3, Malawi. (Stephen J. Price, Conemaugh, PA)

MALTA

Voice of the Mediterranean, 9765 kHz. Full data scenery



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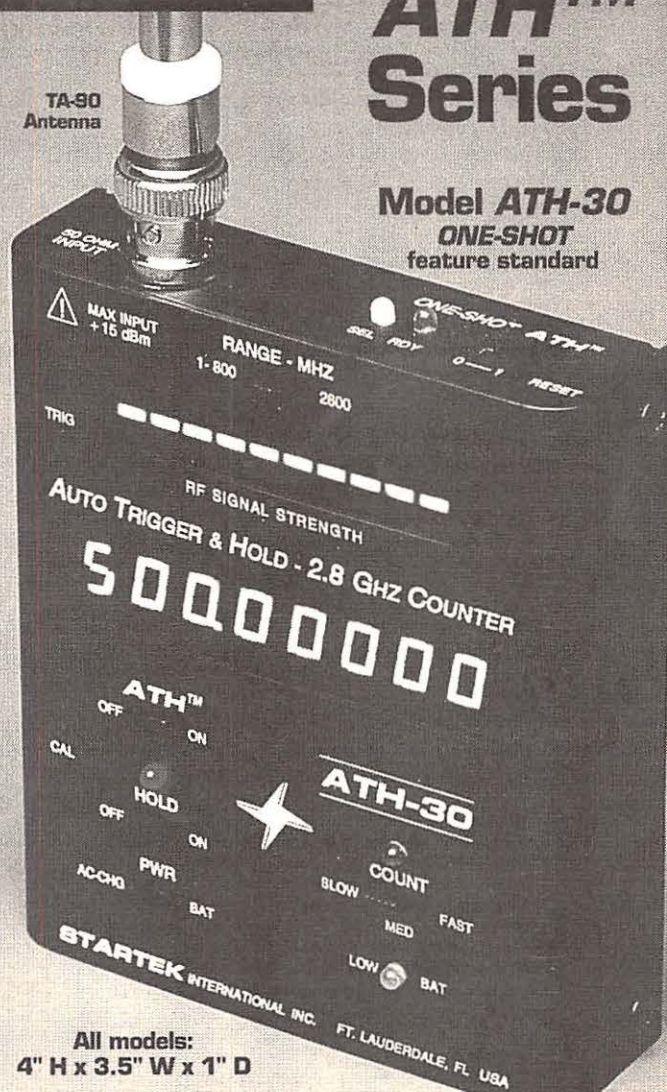


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ATH-15 1-1500 MHZ, ATH	199 235.
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Accessories	
A CC-90 Case for all models	12.
B TA-90 Telescope BNC antenna	12.
C TA-90-L Telescope elbow antenna	16.
D RD-150 150 MHZ rubber duck	16.
E RD-2750 27-50 MHZ rubber duck	28.
F RD-800 800 MHZ rubber duck	29.
G M-207-IC Interface cable for MFJ-207	10.
H P-110 200 MHZ, 1x, 10x probe	39.
J LP-22 Lo-Pass, audio usage probe	25.
K DC-10 Direct, 50 OHM probe	20.

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How to Use the Shortwave Guide

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Daylight Saving Time) 4, 5, 6, or 7 hours for Eastern, Central, Mountain, or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC: for example, the BBC's "Ken Bruce Show" (0030 UTC Sunday) will be heard on Saturday evening (8:30 PM Eastern, 5:30 PM Pacific) in North America, not on Sunday.

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours. If it's news you're interested in, check out the complete "Newsline" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a re-run, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday W: Wednesday A: Saturday
M: Monday H: Thursday
T: Tuesday F: Friday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

4: Choose the most promising frequencies for the time, location, and conditions.

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am: The Americas as: Asia
na: North America au: Australia
ca: Central America pa: Pacific
sa: South America va: various
eu: Europe do: domestic broadcast
af: Africa om: omnidirectional
me: Middle East

Consult the propagation charts. To further help you find the right frequency, we've included propagation charts at the back of this section, which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

Hot News and Hot Spots

Fire Strikes Again

WWCR expects transmissions to be restored earlier than first anticipated after a major fire in April. Keep watch on 5935, 7435, 12160, 13845, and 15685 kHz for new activity.

Meanwhile another broadcaster has experienced a major fire. A report from Guy Atkins to *Fine Tuning* notified the hobby that Radio Cook Islands' shortwave transmitter was destroyed in a transmitter fire at the telecommunications facility in May.

The 11760 kHz transmitter and antenna had been located in a Telecom Cook Islands (local phone company) building which was destroyed. Station personnel felt fairly positive that they would return to shortwave "in about five years," and felt all they needed was "one more tube or other part" to get RCI operational. The station does continue to broadcast on AM/FM on the main island of Rarotonga.

Shortwave is obviously a low priority at Radio Cook Islands now that repeaters are in place to serve the outer islands.

New Name

This June edition of the Shortwave Guide reflects a change that was announced for the end of March: Radio Sofia has indeed been renamed

Radio Bulgaria. Sometimes it's best to wait until you hear it yourself before changing the database!

New Country

For shortwave country chasers, a new country is on the way! From an Associated Press report from Asmara, Eritrea, Eritrea will officially pronounce its independence on May 24, the 2nd anniversary of the liberation of Asmara, and immediately apply for membership in the United Nations. An independent Eritrea on the Red Sea will leave Ethiopia landlocked.

While some Ethiopians strongly oppose the referendum, the new government of former rebels in Addis Ababa takes a calm view. Addis Ababa fell to the Ethiopian People's Revolutionary Democratic Front three days after the Eritreans took Asmara.

Although fighting for different goals, the two rebel movements were loosely allied and cooperation between their provincial government has been good. Ethiopia has now given free access to

RED CROSS BROADCASTING SERVICE

March - August, 1993

Target Area	Time (UTC)	Language	Frequency (kHz)	Days and Dates of Transmission
EUROPE	1100-1130	EN	7210	Sundays: 28.03.93
	1130-1200	FR	7210	25.04.93
	1200-1220	GE	7210	30.05.93
	1220-1240	SP	7210	27.06.93
				25.07.93
EUROPE	1700-1730	EN	7210	29.08.93
	1730-1800	FR	7210	Mondays: 29.03.93
	1800-1820	GE	7210	26.04.93
	1820-1840	SP	7210	31.05.93
				28.06.93
				26.07.93
				30.08.93

EN = English / FR = French / GE = German / SP = Spanish

Eritrea's deep-water ports of Massawa and Assab. The Voice of the Broad Masses of Eritrea is the station to hear and QSL from Eritrea.

Less is More in Lithuania

Less English means more Lithuanian at Radio Vilnius (11750 kHz), which has temporarily compressed its 2300-2330 English broadcasts to air weekdays only. Lithuanian will fill the slot on Saturdays and Sundays, according to a contribution from Arunas Silickas heard on HCJB's *DX Partyline*.

Thanks to Gayle Van Horn and Glenn Hauser for this month's items.

MT Monitoring Team

P.O. Box 98, Brasstown, NC 28902-0098

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Ontario, Canada

Kannon Shanmugam
Program Manager
Kansas

Dave Datko **B.W. Battin**
California New Mexico

John Carson
Oklahoma

Jim Frimmel
Texas

July Deadline:
May 28

newsline

"Newsline" is your guide to news broadcasts on the air. • All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. • All broadcasts are daily unless otherwise noted by the day codes.

0000 UTC

(8:00 PM EDT, 5:00 PM PDT)

BBC ("Newsdesk")
CBC, Northern Quebec
China Radio Int'l
Christian Science Monitor
Croatian Radio, Zagreb [M-A]
Radio Australia
Radio Bulgaria
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l
Radio Norway Int'l [M]
Radio Prague
Radio Thailand
Radio Ukraine Int'l
SBC Radio 1, Singapore
Spanish National Radio
Swiss Radio Int'l
Voice of America
WWCR [T-A]

0005

Radio Pyongyang

0010

China Radio Int'l*
0030
All India Radio
C. Science Monitor (as) [M]
Christian Science Monitor [T-F]
FEBC Radio Int'l, Philippines
HCJB
Radio Havana Cuba [T-S]
Radio Korea
Radio Moscow
Radio Netherlands
Radio New Zealand Int'l [M-F]
Radio Yugoslavia
Voice of America (am,as)
(Special English) [T-S]
V. of America (as) (Spec Eng) [M]

0035

All India Radio (News Service)

0045

Radio Korea (News Service)

0055

WRNO [W. A.]

0100 UTC

(9:00 PM EDT, 6:00 PM PDT)

BBC
CBC, Northern Quebec [S-M]
Christian Science Monitor
Croatian Radio, Zagreb [S]
Deutsche Welle
FEBC Radio Int'l, Philippines

Radio Australia
Radio Canada Int'l [S-M]
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Norway Int'l [M]
Radio Romania Int'l
Radio Slovakia Int'l
Radio Tashkent
Radio Thailand
Radiotelevisione Italiana
SBC Radio 1, Singapore
Spanish National Radio
Voice of America
Voice of Indonesia
WWCR [T-A]

0115

Radio Havana Cuba* [T-S]

0125

Radio Korea [T-A]

0130

C. Science Monitor (as) [M]
Christian Science Monitor [T-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Bangladesh
Radio Havana Cuba [T-S]
Radio Moscow
Radio Netherlands
Radio Tirana
Radio Yugoslavia
Voice of Greece
0145
Radio Finland [T-S]
0155
Voice of Indonesia

0200 UTC

(10:00 PM EDT, 7:00 PM PDT)

BBC ("Newsdesk")
CBC, Northern Quebec [T-S]
Channel Africa, Johannesburg
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Budapest
Radio Canada Int'l [T-A]
Radio Havana Cuba [T-S]
Radio Moscow
Radio New Zealand Int'l [M-A]
Radio Norway Int'l [M]
Radio Thailand
RAE, Buenos Aires [T-A]
SBC Radio 1, Singapore

Swiss Radio Int'l

Voice of America
Voice of Free China
Voice of Myanmar
WWCR [T-A]

0215

Radio Cairo

Radio Nepal

0230

Christian Science Monitor
(af,me) [M]
Christian Science Monitor [T-F]
HCJB

Radio Havana Cuba [T-S]

Radio Moscow

Radio Netherlands

Radio Pakistan (Special English)

Radio Portugal [T-A]

Radio Tirana

SLBC, Sri Lanka

0245

All India Radio (News Service)

0250

Radio Yerevan

0300 UTC

(11:00 PM EDT, 8:00 PM PDT)

BBC
CBC, Northern Quebec
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
Deutsche Welle
Radio Australia
Radio Bahrain
Radio Bulgaria
Radio Havana Cuba [T-S]
Radio Japan
Radio Moscow
Radio Prague
Radio Romania Int'l
SBC Radio 1, Singapore
Voice of America
Voice of Free China
WRNO [F]
WWCR [T-A]

0305

Radio Bangladesh

0309

BBC*

0310

China Radio Int'l*

0315

Radio Cairo
Radio Havana Cuba* [T-S]

0330

BBC (af)*

C. Science Monitor (af,me) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l [T-A]

Radio Bahrain

Radio Havana Cuba [T-S]

Radio Moscow

Radio Netherlands

UAE Radio, Dubai

Voice of Greece

0355

Radio Japan [M-F]
WYFR (Network) [T-A]

0400 UTC

(12:00 AM EDT, 9:00 PM PDT)

BBC
CBC, Northern Quebec [T-S]
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
Deutsche Welle
Kol Israel
Radio Australia
Radio Bahrain
Radio Canada Int'l
Radio Havana Cuba [T-S]
Radio Moscow
Radio Norway Int'l [M]
Radio Prague
Radio Tanzania
Radio Thailand
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Turkey
ZNBC Radio 2, Lusaka

0402

Radio Botswana

0405

Radio Pyongyang

0410

China Radio Int'l*

0425

Radiotelevisione Italiana

0430

C. Science Monitor (af,as) [M]
Christian Science Monitor [T-F]
Radio Bahrain
Radio Finland [M-A]
Radio Havana Cuba [T-S]
Radio Moscow
Radio Romania Int'l
0445

BBC (af)* [M-F]

0450

Channel Africa, Johannesburg

0500 UTC

(1:00 AM EDT, 10:00 PM PDT)

BBC ("Newshour")
CBC, Northern Quebec
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
Deutsche Welle
HCJB
NBC, Windhoek
Radio Australia
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Japan
Radio Lesotho
Radio Moscow
Radio Thailand
SBC Radio 1, Singapore
Spanish National Radio
Voice of America
WWCR [M]
ZNBC Radio, Lusaka

0510

China Radio Int'l*

Radio Botswana [M-A]

0515

Radio Canada Int'l [M-F]
Radio Havana Cuba* [T-S]

0520

Radio For Peace Int'l [T-A]

0530

C. Science Monitor (af,as) [M]
Christian Science Monitor [T-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Moscow
Radio Romania Int'l
Radio Thailand
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
0545
Radio Romania Int'l
Voice of Nigeria*

0600 UTC

(2:00 AM EDT, 11:00 PM PDT)

BBC
BBC (af)* [A-S]
Channel Africa, Johannesburg
Christian Science Monitor

Deutsche Welle
GBC Radio, Accra*
Radio Australia
Radio Bahrain
Radio Havana Cuba [T-S]
Radio Korea
Radio Moscow
Radio New Zealand Int'l
Radio Nigeria
Radio Prague
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Malaysia
ZNBC Radio, Lusaka [M-A]
0603
Croatian Radio, Zagreb [M-A]
0605
Radio Pyongyang
0609
BBC*
0630
BBC (af)* [M-F]
Christian Science Monitor [M-F]
Radio Austria Int'l [T-A]
Radio Havana Cuba [T-S]
Radio Moscow
Radio Vlaanderen Int'l
RTV Congolaise, Brazzaville [M-F]
Voice of Nigeria
0645
Radio Finland [M-A]
Voice of Nigeria*
0655
Radio Korea [M-F]

0700 UTC
(3:00 AM EDT, 12:00 AM PDT)
BBC ("Newsdesk")
Christian Science Monitor
GBC Radio, Accra
LBS, Monrovia
MBC, Blantyre [M-A]
Radio Australia
Radio Bangladesh
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Nigeria, Ibadan
SBC Radio 1, Singapore
SLBS, Freetown
Voice of Free China
Voice of Myanmar
0703
Croatian Radio, Zagreb [S]
0705
Radio Pyongyang
0730
All India Radio (News Service)
BBC (af)* [A]
Christian Science Monitor [M-F]
HCJB
Radio Austria Int'l
Radio Ghana
Radio Moscow
Radio Netherlands
Radio Prague
0750
Radio For Peace Int'l [T-A]
Radio New Zealand Int'l* [M-F]
Radio Pacific Ocean [A]
0755
Radio Japan [M-F]

0800 UTC
(4:00 AM EDT, 1:00 AM PDT)
BBC
Christian Science Monitor
GBC Radio 1, Accra [S]
GBC Radio 2, Accra
MBC, Blantyre [S]
Radio Australia

Radio Bahrain
Radio Korea
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Pakistan
SBC Radio 1, Singapore
SLBS, Freetown
Voice of Indonesia
Voice of Malaysia
ZNBC Radio 2, Lusaka [M-A]
0802
Radio Botswana
0803
Croatian Radio, Zagreb [M-A]
0805
Radio Pyongyang
0830
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Moscow
Radio Netherlands
Radio Slovakia Int'l
0840
Voice of Greece [M-A]
0850
All India Radio (News Service)
(Special English)
0855
Radio Korea [M-F]
Voice of Indonesia

0900 UTC
(5:00 AM EDT, 2:00 AM PDT)
BBC
China Radio Int'l
Christian Science Monitor
Deutsche Welle
GBC Radio 1, Accra [M-F]
GBC Radio 2, Accra
LBS, Monrovia
MBC, Blantyre M-A]
Radio Australia
Radio Bahrain
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Vlaanderen Int'l [M-A]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of Nigeria
0910
China Radio Int'l*
0915
Radio Korea (News Service)
0930
All India Radio (News Service)
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Afghanistan
Radio Moscow
Radio Netherlands
0940
Radio Togo
0945
Deutsche Welle (af)* [M-F]
0955
Radio Japan [M-F]

1000 UTC
(6:00 AM EDT, 3:00 AM PDT)
All India Radio
BBC
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
GBC Radio 2, Accra [A]
HCJB
Kol Israel
MBC, Blantyre [S]
Radio Australia
Radio Bahrain
Radio Moscow

1000 UTC
(6:00 AM EDT, 3:00 AM PDT)
All India Radio
BBC
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
GBC Radio 2, Accra [A]
HCJB
Kol Israel
MBC, Blantyre [S]
Radio Australia
Radio Bahrain
Radio Moscow

Radio New Zealand Int'l [S]
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
WWCR [M-F]
WYFR (Network) [M-F]
ZNBC Radio 2, Lusaka [M-A]
1010
China Radio Int'l*
1030
Christian Science Monitor [M-F]
MBC, Blantyre [M-F]
Radio Austria Int'l [M-F]
Radio Bulgaria
Radio Korea
Radio Moscow
Radio Prague
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
WYFR (Network) [M-F]
1040
Voice of Greece [M-A]
1055
All India Radio

1100 UTC
(7:00 AM EDT, 4:00 AM PDT)
BBC ("Newsdesk")
CBC, Northern Quebec [A-S]
Channel Africa, Johannesburg
Christian Science Monitor
Deutsche Welle
GBC Radio, Accra [A-S]
MBC, Blantyre [A-S]
Radio Australia
Radio Bahrain
Radio Japan
Radio Jordan
Radio Korea
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Nigeria, Ibadan
Radio Pakistan
SBC Radio 1, Singapore
Swiss Radio Int'l
TWR, Bonaire [M-F]
Voice of America
WWCR [M-F]
ZNBC Radio, Lusaka
1105
Radio Pakistan (Special English)
Radio Pyongyang
1110
Radio Botswana [M-F]
1115
Radio Korea (News Service)
Radio Nepal
1125
Radio Botswana [A-S]
Radio New Zealand Int'l* [M-F]
WYFR (Network) [M-F]
1130
Christian Science Monitor [M-F]
Radio Austria Int'l [M-F]
Radio Finland [M-F]
Radio Lesotho
Radio Moscow
Radio Netherlands
Radio Thailand
Radio Vlaanderen Int'l [S]
Radio Yugoslavia
RTM, Malaysia*
1135
All India Radio (News Service)
1145
Deutsche Welle* [M-F]
1150
Channel Africa, Johannesburg
1155
Radio Japan [M-F]
Radio Korea [M-F]

1200 UTC
(8:00 AM EDT, 5:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
China Radio Int'l
Christian Science Monitor
LBS, Monrovia
MBC, Blantyre [M-F]
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Canada Int'l [M-F]
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l [M-F]
Radio Nigeria, Ibadan
Radio Norway Int'l [S]
Radio Romania Int'l
Radio Tashkent
Radio Thailand
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
TWR, Bonaire [A-S]
Voice of America
WYFR (Network) [M-F]
1203
Croatian Radio, Zagreb
1210
China Radio Int'l*
1215
HCJB [M-F]
Radio Korea
1230
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Cairo
Radio Finland [M-F]
Radio France Int'l
Radio Moscow
Radio Netherlands
SLBC, Sri Lanka
WYFR (Network) [M-F]
1235
Voice of Greece
1245
SLBC, Sri Lanka
1255
Radio Bangladesh
1257
HCJB [M-F]
1258
Africa Number One, Libreville

1300 UTC
(9:00 AM EDT, 6:00 AM PDT)
BBC ("Newshour")
CBC, Northern Quebec
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
Kol Israel [S-H]
Radio Australia
Radio Bahrain
Radio Canada Int'l (na) [S]
Radio Iraq Int'l
Radio Jordan
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Norway Int'l [S]
Radio Tanzania [A-S]
Radio Vlaanderen Int'l [M-A]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
WYFR (Network) [M-F]
1305
Radio Pyongyang
1310
China Radio Int'l*
Radio Korea [M-F]
1320
Radio For Peace Int'l [T-A]

SLBC, Sri Lanka
1325
HCJB [M-F]
1328
Radio Cairo
1330
All India Radio
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l [M-F]
Radio Canada Int'l (as)
Radio Finland [M-A]
Radio Moscow
Radio Netherlands
Radio Romania Int'l
Radio Tashkent
RTM, Malaysia
UAE Radio, Dubai
Voice of America (Spec Eng)
Voice of Turkey
1346
All India Radio [A]

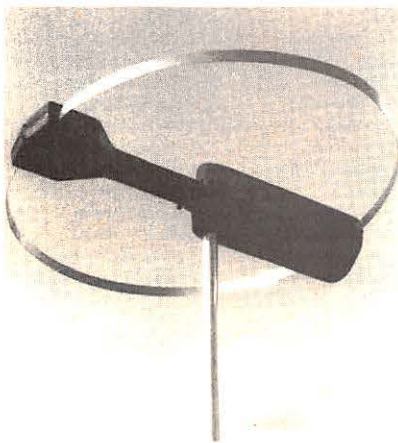
1400 UTC
(10:00 AM EDT, 7:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
LBS, Monrovia
MBC, Blantyre [M-F]
Radio Australia
Radio Bahrain
Radio Canada Int'l (na) [S]
Radio France Int'l
Radio Japan
Radio Korea
Radio Liberia
Radio Moscow
RTM, Malaysia*
SBC Radio 1, Singapore
Voice of America
WWCR [M-F]
ZNBC Radio 2, Lusaka [M-F]
1402
Radio Finland [M-A]
1410
China Radio Int'l*
1415
LBS, Monrovia (Special English)
Radio Canada Int'l (eu)
Radio Korea (News Service)
Radio Nepal
1425
HCJB [M-F]
LBS, Monrovia
1430
All India Radio (News Service)
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Moscow
Radio Netherlands
WYFR (Network) [M-F]
1440
FEBC Radio Int'l, Philippines*
[M-F]
1445
All India Radio
BBC (as) (Special English) [M-F]
Voice of Myanmar
1455
Radio Korea [M-F]

1500 UTC
(11:00 AM EDT, 8:00 AM PDT)
BBC
CBC, Northern Quebec [A-S]
China Radio Int'l
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra

STEP UP YOUR SHORTWAVE SET UP.

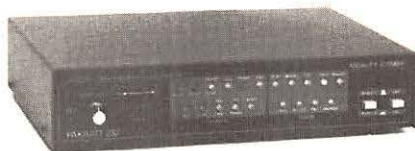
ISOLOOP 10-30 HF PORTABLE ANTENNA.

This is the one that gives you freedom of speech, whether you have to deal with restrictive covenants at home or in your apartment or condo, or if you are traveling in your boat, car, or RV. It features 150 watts, continuous coverage from 10 to 30 MHz, narrow bandwidth to suppress out-of-band signals. The IsoLoop antenna comes fully assembled with no mechanical joints. There is simply no better value in antennas!



PK-232MBX DIGITAL MULTI-MODE CONTROLLER.

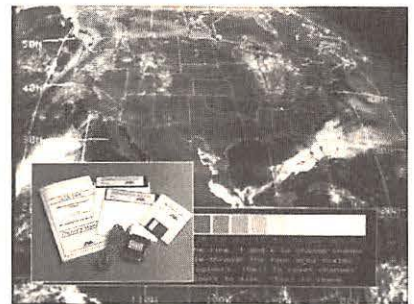
It can receive eight different types of data signals, including Morse code, Baudot, ASCII, Time Division Multiplex (TDM), WEFAX, NAVTEX, Packet and AMTOR. Also featured is SIAM which automatically identifies many types of digital signals, excellent software support for PC compatibles, Macintosh and Commodore 64 & 128 computers. This unit is essential for the serious digital listener.



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Radio Jordan
Radio Moscow
Radio Nigeria
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Radio Portugal [M-F]
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
Voice of Ethiopia
WYFR (Network) [A]
1505
Radio Pyongyang
1510
China Radio Int'l*
1520
Radio Tallinn [M-F]
Voice of Greece
1525
Radio Veritas Asia [T-F]
1530
All India Radio (News Service)
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
FEBA, Seychelles
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Bangladesh
Radio Moscow
Radio Netherlands
Radio Tirana
Voice of Ethiopia
Voice of Nigeria
1540
Radio Veritas Asia [A-M]
Voice of Nigeria*
1545
Radio Korea (News Service)
1550
Radio For Peace Int'l [T-A]
1555
Radio Veritas Asia [A-M]

1600 UTC
(12:00 PM EDT, 9:00 AM PDT)
BBC
CBC, Northern Quebec [A]
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
LBS, Monrovia
MBC, Blantyre
Radio Australia
Radio Bahrain
Radio Canada Int'l
Radio France Int'l
Radio Jordan
Radio Korea
Radio Lesotho
Radio Liberia
Radio Moscow
Radio Nigeria
Radio Norway Int'l [S]
Radio Pakistan
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
Yemen Radio
ZNBC Radio 2, Lusaka [M-A]
1609
BBC*
1610
China Radio Int'l*
Radio Botswana [M-F]
1615
Radio Pakistan (Special English)

1630
Christian Science Monitor [M-F]
HCJB [M-F]
Radio Canada Int'l (as)
Radio Moscow
Radio Romania Int'l
UAE Radio, Dubai
V. of America (eu) (Spec Eng)
1655
Radio Korea [M-F]

1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
BBC
CBC, Northern Quebec [A]
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
GBC Radio 2, Accra
Kol Israel
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Japan
Radio Moscow
Radio Nigeria, Kaduna
Radio Norway Int'l [S]
Radio Pakistan
Radio Prague
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
WWCR [M-F]
1705
Radio Bangladesh
Radio Pyongyang
1710
China Radio Int'l*
1715
Radio Korea (News Service)
1725
Radio Surinam Int'l [M-F]
1730
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Bulgaria
Radio Moscow
Radio Netherlands
1740
BBC (af)*
1750
Channel Africa, Johannesburg

1800 UTC
(2:00 PM EDT, 11:00 AM PDT)
All India Radio
BBC ("Newsdesk")
CBC, Northern Quebec [M-H]
Christian Science Monitor
GBC Radio, Accra
KVOH
MBC, Blantyre
Radio Afghanistan
Radio Australia
Radio Bahrain
Radio Canada Int'l
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l [S-F]
Radio Omdurman, Sudan
Radio Portugal [M-F]
Radio Romania Int'l
Radio Tanzania
Radio Vlaanderen Int'l
Voice of America
WWCR [M-F]
ZNBC Radio, Lusaka
1815
ZNBC Radio 2, Lusaka*
1825
Radio New Zealand Int'l* [M-F]
1830
BSKSA, Riyadh
Christian Science Monitor [M-F]

Polish Radio, Warsaw
Radio Austria Int'l
Radio Finland [S-F]
Radio Kuwait
Radio Mogadishu
Radio Moscow
Radio Netherlands
Radio Slovakia Int'l
Radio Yugoslavia
Voice of America (Spec Eng)
1840
Voice of Greece
1845
BSKSA, Riyadh*
Radio Cote d'Ivoire
Radio Guinea, Conakry
1855
Radio Omdurman, Sudan
1857
BBC (af)* [M-F]

1900 UTC
(3:00 PM EDT, 12:00 PM PDT)
All India Radio
BBC
China Radio Int'l
Christian Science Monitor [M-A]
Deutsche Welle
GBC Radio 2, Accra*
HCJB
Kol Israel
KVOH
Radio Australia
Radio Canada Int'l
Radio Japan
Radio Korea
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Norway Int'l [S]
Radio Portugal [M-F]
Radio Vilnius
RAE, Buenos Aires [M-F]
SLBS, Freetown
Spanish National Radio
Voice of America
1903
Croatian Radio, Zagreb [S]
Voice of Greece
1905
Radio New Zealand Int'l* [S-F]
1910
China Radio Int'l*
Radio Botswana
1930
BBC (af)* [S, F]
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Polish Radio, Warsaw
Radio Ghana
Radio Moscow
Radio Netherlands
Voice of Nigeria
1935
Radio New Zealand Int'l* [F]
Radiotelevisione Italiana
1945
Radio Bulgaria
Radio Togo

1955
Radio Korea [M-F]
Radio New Zealand Int'l* [S-H]
2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
BBC
CBC, Northern Quebec [S-F]
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
KVOH
MBC, Blantyre
Radio Australia

2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
BBC
CBC, Northern Quebec [S-F]
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
KVOH
MBC, Blantyre
Radio Australia

Radio Bahrain
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Prague
Radio Romania Int'l
SLBS, Freetown
Swiss Radio Int'l
Voice of America
Voice of Indonesia
Voice of Nigeria
ZNBC Radio 2, Lusaka
2002
Radio Botswana
2005
Radio Pyongyang
2010
China Radio Int'l*
2025
Radiotelevisione Italiana
2030
Christian Science Monitor [M-F]
Radio Moscow
Radio Nacional de Angola
2045
BSKSA, Riyadh
Radio Korea (News Service)
2055
Voice of Indonesia

2100 UTC
(5:00 PM EDT, 2:00 PM PDT)
All India Radio
BBC ("Newshour")
CBC, Northern Quebec [S-F]
China Radio Int'l
Christian Science Monitor [M-A]
Deutsche Welle
GBC Radio 2, Accra*
KVOH
MBC, Blantyre
Radio Australia
Radio Bahrain
Radio Budapest
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Iraq Int'l
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Nigeria
Radio Norway Int'l [S]
Radio Prague
Radio Ukraine Int'l
Radio Vlaanderen Int'l
Radio Yugoslavia
SLBS, Freetown
Spanish National Radio
Voice of America
Voice of Turkey
ZNBC Radio 2, Lusaka
2103
Croatian Radio, Zagreb
2110
China Radio Int'l*
Radio New Zealand Int'l* [S-H]
2115
Radio Finland [S-F]
2120
Radio Cairo
Radio For Peace Int'l [M-F]
2125
Radio Havana Cuba* [M-A]
2130
Christian Science Monitor [M-F]
Kol Israel
Radio Austria Int'l [M-F]
Radio Cairo
Radio Havana Cuba [M-A]
Radio Moscow
Radio Vilnius
2145
Radio Bulgaria

Radio Korea
Radio Yerevan
2200 UTC
(6:00 PM EDT, 3:00 PM PDT)
All India Radio
BBC
CBC, Northern Quebec [M-F]
China Radio Int'l
Christian Science Monitor
CIOX, Montreal [M-F]
GBC Radio 2, Accra
MBC, Blantyre
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Moscow
Radio New Zealand Int'l [A-H]
Radio Tirana
Radiotelevisione Italiana
SBC Radio 1, Singapore
SLBS, Freetown
Swiss Radio Int'l
Voice of America
Voice of Free China
2209
BBC*
2210
China Radio Int'l*
Radio New Zealand Int'l* [S-H]
2215
Radio Cairo
2225
Radio Havana Cuba* [M-A]
2230
Christian Science Monitor [M-F]
Radio Havana Cuba [M-A]
Radio Moscow
Voice of America (Spec Eng)
2240
Radio Cairo
Radio Korea [M-F]
Voice of Greece
2245
GBC Radio, Accra
Radio Yerevan

2300 UTC
(7:00 PM EDT, 4:00 PM PDT)
All India Radio
BBC
CBC, Northern Quebec [A]
Christian Science Monitor [M-A]
Radio Australia
Radio Canada Int'l
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [A-H]
Radio Norway Int'l [S]
Radio Vilnius
RTM, Malaysia
SBC Radio 1, Singapore
Voice of America
Voice of Turkey
WYFR (Network) [M-F]
2305
Radio Pyongyang
2330
Christian Science Monitor [M-F]
Radio Moscow
Radio Nacional, Bogota [A]
Radio Netherlands
Radio Vlaanderen Int'l
RTM, Malaysia*
2335
Voice of Greece
2345
SLBC, Sri Lanka [M]
2350
Radio For Peace Int'l [M-F]
2355
Radio Japan [M-F]
WRNO [W, F]

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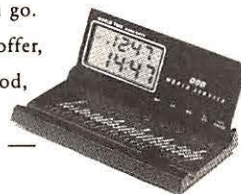


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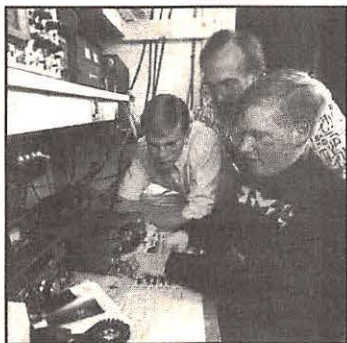
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0000 UTC

[8:00 PM EDT/5:00 PM PDT]

FREQUENCIES

0000-0100	Australia, ABC Brisbane	4920do	9660do		
0000-0100	Australia, ABC Perth	9610do			
0000-0030	Australia, Radio	5880pa	13605pa	15320as	15365pa
		17750as	17840as		
		9770na	11720na	15330na	
0000-0100	Bulgaria, Radio	6005do			
0000-0100	Canada, CFCX Montreal	6070do			
0000-0100	Canada, CFRX Toronto	6030do			
0000-0100	Canada, CFVP Calgary	6130do			
0000-0100	Canada, CHNX Halifax	6160do			
0000-0100	Canada, CKZU Vancouver	9770na	11715na		
0000-0100	China, China Radio Intl	9725ca	11870ca		
0000-0100	Costa Rica, AWR Alajuela	7375na	7385na	13630na	15030na
0000-0100	Costa Rica, R for Peace Int	21465na			
0000-0100 a	Croatian Radio via WHRI	7315na	15015na		
0000-0100	Cuba, Radio Havana Cuba	6010na			
0000-0030	Czech Republic, R Prague	5930na	7345na	9485na	9810na
		11990na			
0000-0045	India, All India Radio	9910as	11715as	11745as	15110as
0000-0100	Netherlands, Radio	6020na	6165na		
0000-0100	New Zealand, R NZ Intl	15120pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0030 m	Norway, Radio Norway Intl	9675na			
0000-0100	Palau, KHBN	9830va			
0000-0100	Philippines, FEBC Manila	15450as			
0000-0100	Russia, Radio Moscow	6000na	7150na	7220na	9480na
		9765na	9815na	9840as	11750na
		12050na	15425na	15470na	17560na
		17570as	17655na	17860as	21625as
		21690as			
0000-0100	Singapore, SBC1	5010do	5052do	11940do	
0000-0100	Slovakia, Slovak Radio	7130na	9810na		
0000-0100	Spain, Spanish Natl Radio	9530na			
0000-0030	Switzerland, Swiss R Intl	6135na	9650na	9885na	12035na
		17730na			
0000-0100	Thailand, Radio	9655as	11905as		
0000-0100	Ukraine, R Ukraine Intl	15580eu			
0000-0030	United Kingdom, BBC London	5975na	6005sa	6175na	6180eu
		6195as	7325am	9570as	9580as
		9590na	9915am	11750sa	11945as
		11955as	12095na	15070na	15260sa
		15280na	15360pa		
0000-0100	USA, CS Monitor Boston MA	5850na	9850af	13760sa	17555as
0000-0100 sa	USA, CS Monitor Boston MA	17865as			
0000-0100	USA, KCBi Dallas TX	15725am			
0000-0100	USA, KTNB Salt Lk City UT	15590am			
0000-0100	USA, VOA Washington DC	5995am	6130am	7120as	7290as
		7405am	9455am	9775am	11695am
		11760am	15120am	15185as	15205am
		15290as	17735as	17820as	
0000-0100	USA, WEWN Birmingham AL	7425na	13710na		
0000-0100	USA, WHRI Noblesville IN	7315na			
0000-0100	USA, WINB Red Lion PA	15145eu			
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100	USA, WRNO New Orleans LA	7355na			
0000-0100	USA, WYFR Okeechobee FL	6085na			
0010-0015	Kirghizia, Kirghiz Radio	6080as			
0030-0100	Australia, Radio	11880pa	15240pa	15320as	15365pa
		17750as	17795pa	17880as	21740pa
0030-0100	Belgium, R Vlaanderen	9930na	13655sa		
0030-0100	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0030-0100	Iran, VOIRI Tehran	9022am	11790am	15260am	
0030-0100	Netherlands, Radio	6020na	6165na	9825as	9860as
		11655as	11835na	13700as	
0030-0100	Serbia, Radio Yugoslavia	9580na	11870na		
0030-0100	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0030-0100	United Kingdom, BBC London	5975na	6005sa	6175na	6180eu
		7325am	9580as	9590am	9915am
		11750sa	12095na	15260sa	15310as
		15360pa			
0035-0040	India, All India Radio	4860do	5120as	11920as	

SELECTED PROGRAMS

Sundays

- 0005 Christian Science Monitor: Christian Science Sentinel. Religious programming explaining the doctrine of Christian Science.
- 0010 Voice of America (am, ca): On The Line. No details available.
- 0010 Voice of America (as): VOA Morning. Sports, science, business, music, and features about America.
- 0030 BBC: The Ken Bruce Show. Ken Bruce plays the latest releases, from pop to jazz to country.
- 0030 Voice of America (ca): Weekend Magazine. Music, conversations with correspondents, and talks about the arts.
- 0040 Voice of America (am, as): Words And Their Stories (Special English). Explanations of the origins of American expressions.
- 0045 Voice of America (am): American Stories (Special English). Fictional tales by great American writers.
- 0045 Voice of America (as): VOA Morning. See S 0010.

Mondays

- 0005 Christian Science Monitor (am, af): The Sunday Service. See S 1605.
- 0006 Christian Science Monitor (as): News Features And Interviews. In-depth news analyses, focusing on major international events.
- 0010 Voice of America (am, ca): Encounter. See S 1210.
- 0010 Voice of America (as): Newline. See S 2310.
- 0030 BBC: In Praise Of God. Christian religious services and meditations.
- 0030 Voice of America (am, ca): Spotlight. Reports and interviews on people, places, and events of interest to listeners in the Caribbean and Latin America.
- 0040 Voice of America (as): Science Report (Special English). Developments in the world of science and technology.
- 0045 Voice of America (as): VOA Morning. See S 0010.

Tuesdays

- 0006 Christian Science Monitor: News Features And Interviews. See M 0006.
- 0010 Voice of America (am, as): Newline. See S 2310.
- 0010 Voice of America (ca): Caribbean Report. The latest news, sports, financial news, and weather reports for the Caribbean.
- 0030 BBC: Panel Game. A game show on various topics.
- 0030 Voice of America (ca): Music, UA. (Standards). See M 1130.
- 0040 Voice of America (am, as): Science Report (Special English). See M 0040.
- 0045 Voice of America (am): This Is America (Special English). See M 1115.
- 0045 Voice of America (as): VOA Morning. See S 0010.

Wednesdays

- 0006 Christian Science Monitor: News Features And Interviews. See M 0006.
- 0010 Voice of America (am, as): Newline. See S 2310.
- 0010 Voice of America (ca): Caribbean Report. See T 0010.
- 0030 BBC: Omnibus. Topical features on a range of topics, from Dracula to drugs.
- 0030 Voice of America (ca): Now Music, UA. See T 1130.
- 0040 Voice of America (am, as): Science Report (Special English). See M 0040.
- 0045 Voice of America (am): Science In The News (Special English). See T 1115.
- 0045 Voice of America (as): VOA Morning. See S 0010.

Thursdays

- 0006 Christian Science Monitor: News Features And Interviews. See M 0006.
- 0010 Voice of America (am, as): Newline. See S 2310.
- 0010 Voice of America (ca): Caribbean Report. See T 0010.
- 0030 BBC: Comedy. See W 1530.

- 0030 Voice of America (ca): Now Music, UA. See T 1130.
- 0040 Voice of America (am, as): Science Report (Special English). See M 0040.
- 0045 Voice of America (am): Space And Man (Special English). See W 1115.
- 0045 Voice of America (as): VOA Morning. See S 0010.

Fridays

- 0006 Christian Science Monitor: News Features And Interviews. See M 0006.
- 0010 Voice of America (am, as): Newline. See S 2310.
- 0010 Voice of America (ca): Caribbean Report. See T 0010.
- 0030 BBC: Music Feature. Edward Greenfield returns with more "Classic Recordings" (4th, 11th, 18th).
- 0030 Voice of America (ca): Now Music, UA. See T 1130.
- 0040 Voice of America (am, as): Science Report (Special English). See M 0040.
- 0045 Voice of America (am): The Making Of A Nation (Special English). See H 0045.
- 0045 Voice of America (as): VOA Morning. See S 0010.

Saturdays

- 0005 Christian Science Monitor: Christian Science Sentinel. See S 0005.
- 0010 Voice of America: Newline. See S 2310.
- 0030 BBC: From The Weeklies. The best extracts from the week's newspapers and magazines.
- 0030 Voice of America (ca): Country Music, UA. See F 1130.
- 0040 Voice of America (am): Science Report (Special English). See M 0040.
- 0040 Voice of America (as): Words And Their Stories (Special English). See S 0040.
- 0045 BBC: Recording Of The Week. See M 0615.
- 0045 Voice of America (am): American Mosaic (Special English). See F 1115.
- 0045 Voice of America (as): VOA Morning. See S 0010.

0100 UTC

[9:00 PM EDT/6:00 PM PDT]

FREQUENCIES

0100-0200	Australia, ABC Brisbane	4920do	9660do		
0100-0200	Australia, ABC Perth	9610do			
0100-0200	Australia, Radio	5880pa	11880pa	15240va	15320pa
		15365as	17750as	17795pa	17840as
		17880as	21740pa		
0100-0200	Bulgaria, Radio	9700na	11720na		
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0159 sm	Canada, RCI Montreal	6120na	9535am	9755na	11845am
		11940am			
0100-0130 twhta	Canada, RCI Montreal	9535am	11845am	11940am	
0100-0200	Costa Rica, R for Peace Int	7375am	7385na	13630am	15030am
		21465am			
0100-0200	Cuba, Radio Havana Cuba	6010na	9815na		
0100-0130	Czech Republic, R Prague	7345na	9485na	11990na	
0100-0200	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0100-0150	Germany, Deutsche Welle	6040na	6085na	6145na	9565na
		9700na	9765na	11810na	11865na
		13610na	13770na	15105na	
0100-0200	Guam, KSDA Agana	15610as			
0100-0130	Iran, VOIRI Tehran	9022am	11790am	15260am	
0100-0120	Italy, RAI Rome	9575am	11800am		
0100-0200	Japan, NHK Tokyo	5960na	11815as	11860as	17835as
		17845as			
0100-0130	Laos, National Radio of	7116as			
0100-0200	Namibia, Namibia BC Corp	3290af			
0100-0130	Netherlands, Radio	6020na	6165na	11835na	
0100-0200	New Zealand, R NZ Intl	15120pa			
0100-0130 m	Norway, Radio Norway Intl	9560na			
0100-0200	Palau, KHBH	9830pa			
0100-0200	Philippines, FEBC Manila	15450as			
0100-0200	Russia, Radio Moscow	9480as	9810na	9815eu	9840na
		9870na	9875na	11790as	11805as
		11905as	12050na	15425na	15470na
		17570na	17655as	17835na	17860as
		21625as	21690as	21770as	21790as
0100-0200	Singapore, SBC1	5010do	5052do	11940do	

0100-0127	Slovakia, Slovak Radio	5930am	7310am	9810am	
0100-0130	South Korea, Radio Korea	11865am	15575am		
0100-0200	Spain, Spanish Natl Radio	9530na			
0100-0200	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0100-0130	Sweden, Radio	9695as	11820as		
0100-0200	Thailand, Radio	9655as	11905as		
0100-0130	United Kingdom, BBC London	5975na	6005sa	6175na	6180eu
		7325am	9590am	9590am	9915am
		11750sa	11955as	12095na	15260sa
		15310as	15360pa	17790as	
0100-0200	USA, CSMonitor Boston MA	5850na	9850af	13760sa	17555as
0100-0200 sa	USA, CSMonitor Boston MA	17865as			
0100-0200	USA, KCBI Dallas TX	15725am			
0100-0200	USA, KTNB Salt Lk City UT	7510na			
0100-0200	USA, KVOH Los Angeles CA	17775am			
0100-0200	USA, VOA Washington DC	5995am	6130am	7115as	7205as
		7405am	7650as	9455am	9670va
		9740as	9775am	11580am	11705as
		15120am	15160as	15205am	15250as
		17740as	21550as		
			9825as		
0100-0130	USA, WEWN Birmingham, AL				
0100-0200	USA, WHRI Noblesville IN	7315am			
0100-0200	USA, WINB Red Lion PA	15145na			
0100-0200	USA, WJCR Upton KY	7490na	13595na		
0100-0200	USA, WRNO New Orleans LA	7355na			
0100-0200	USA, WYFR Okeechobee FL	6085am	9505am	15440am	
0100-0130	Uzbekistan, R Tashkent	5955as	5995as	7325as	7335as
		9740as	9755as	11975as	
0130-0200	Albania, R Tirana Intl	9580na	11840na		
0130-0200	Austria, R Austria Intl	6015na	9880na		
0130-0150 mtwhfa	Greece, Voice of	9375na	9420na	11645na	
0130-0200	Netherlands, Radio	9860as	11655as	12025as	13700as
0130-0200 mtwhf	Portugal, Radio	9555na	9570na	9600na	9705na
		11840na			
0130-0200	Serbia, Radio Yugoslavia	9580na	11870na		
0130-0200	United Kingdom, BBC London	5975na	6005na	6175na	6180eu
		7325am	9580am	9590na	9915am
		11750sa	11955as	12095na	15260sa
		15310as	15360pa	17790as	
0145-0200 smtwhf	Finland, Radio	9560na	11755na		
0145-0200	Vatican State, Vatican R	7125pa	9650as		

SELECTED PROGRAMS

Sundays

- 0101 BBC: Play Of The Week. This month: "You May Leave, The Show Is Over" (6th).
- 0105 Christian Science Monitor: Christian Science Sentinel. See S 0005.
- 0110 Voice of America (am,ca): Communications World. A look at modern telecommunications.
- 0110 Voice of America (as): VOA Morning. See S 0010.
- 0130 Voice of America (am,ca): Press Conference, UA. Correspondents ask questions of newsmakers.

Mondays

- 0101 BBC: Feature. Topical programming on various subjects.
- 0106 Christian Science Monitor (as): Encore. Re-runs of the best programs from the week just past.
- 0110 Voice of America (am,ca): New Horizons. See S 1110.
- 0110 Voice of America (as): Newsline. See S 2310.
- 0130 Voice of America (am,ca): Issues In The News. See S 1130.
- 0130 Voice of America (as): VOA Morning. See S 0010.
- 0134 Christian Science Monitor (as): Letterbox. Staff members respond to listener letters.
- 0145 BBC: Musical Feature. This month, Peter Paul Nash meets modern classical musicians in "The Contemporary Virtuoso."
- 0147 Christian Science Monitor (as): Religious Article. A reading from The Christian Science Monitor.

Tuesdays

- 0105 BBC: Outlook. See M 1405.
- 0106 Christian Science Monitor: Home Forum. See M 2306.
- 0110 Voice of America (am,ca): Report To The Americas. News, correspondent reports, interviews, and opinion.
- 0130 Voice of America (as): Newsline. See S 2310.

- 0130 BBC: Folk Routes. Ian Anderson presents a selection of roots music.
- 0130 Voice of America (as): VOA Morning. See S 0010.
- 0134 Christian Science Monitor: Letterbox. See M 0134.
- 0145 BBC: Health Matters. New medical developments and methods of keeping fit.
- 0147 Christian Science Monitor: Religious Article. See M 0147.
- 0155 Voice of America (am,ca): Editorial. See S 1455.

Wednesdays

- 0105 BBC: Outlook. See M 1405.
- 0106 Christian Science Monitor: Curtain Call. See T 2306.
- 0110 Voice of America (am,ca): Report To The Americas. See T 0110.
- 0110 Voice of America (as): Newsline. See S 2310.
- 0130 BBC: Talks. Tony Dorbie talks with small-business experts in "Sound Business" (2nd, 9th).
- 0130 Voice of America (as): VOA Morning. See S 0010.
- 0134 Christian Science Monitor: Letterbox. See M 0134.
- 0145 BBC: Country Style. David Allan profiles the country music scene on both sides of the pond.
- 0147 Christian Science Monitor: Religious Article. See M 0147.
- 0155 Voice of America (am,ca): Editorial. See S 1455.

Thursdays

- 0105 BBC: Outlook. See M 1405.
- 0106 Christian Science Monitor: Kaleidoscope. See W 2306.
- 0110 Voice of America (as): Newsline. See S 2310.
- 0110 Voice of America (as,ca): Report To The Americas. See T 0110.
- 0130 BBC: Waveguide. See W 0415.
- 0130 Voice of America (as): VOA Morning. See S 0010.

- 0134 Christian Science Monitor: Letterbox. See M 0134.
- 0140 BBC: Book Choice. See W 0425.
- 0145 BBC: The Farming World. An examination of agriculture, forestry, and fishing worldwide.
- 0147 Christian Science Monitor: Religious Article. See M 0147.
- 0155 Voice of America (am,ca): Editorial. See S 1455.

Fridays

- 0105 BBC: Outlook. See M 1405.
- 0106 Christian Science Monitor: Arts Forum or Sportsworld. See H 2306.
- 0110 Voice of America (am,ca): Report To The Americas. See T 0110.
- 0110 Voice of America (as): Newsline. See S 2310.
- 0130 BBC: Seven Seas. Malcolm Billings presents news about ships and the sea.
- 0130 Voice of America (as): VOA Morning. See S 0010.
- 0134 Christian Science Monitor: Letterbox. See M 0134.
- 0145 BBC: Global Concerns. An update on environmental issues.
- 0147 Christian Science Monitor: Religious Article. See M 0147.
- 0155 Voice of America (am,ca): Editorial. See S 1455.

Saturdays

- 0105 BBC: Outlook. See M 1405.
- 0105 Christian Science Monitor: Christian Science Sentinel. See S 0005.
- 0110 Voice of America (am,ca): Report To The Americas. See T 0110.
- 0110 Voice of America (as): VOA Morning. See S 0010.
- 0130 BBC: Short Story (except 5th: Seeing Stars). See S 0430.
- 0145 BBC: Jazz Now And Then. George Reid presents a mix of new releases and classic tracks.
- 0155 Voice of America (am,ca): Editorial. See S 1455.

0200 UTC

[10:00 PM EDT/7:00 PM PDT]

FREQUENCIES

0200-0300 twhfa	Argentina, RAE	11710na			
0200-0300	Australia, ABC Brisbane	4920do	9660do		
0200-0300	Australia, ABC Perth	6070do	9610do		
0200-0300	Australia, Radio	5860pa	11720va	15240pa	15365pa
		17715pa	17750as	17795pa	17840as
		21595pa	21740pa		
0200-0300	Bulgaria, Radio	9850na	11765na		
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0259	Canada, RCI Montreal	6120na	9535am	9755na	11845am
		11940am			
0200-0300	Costa Rica, R for Peace Int	7375na	7385na	13630na	15030na
		21465am			
0200-0300	Cuba, Radio Havana Cuba	6010na	13660na		
0200-0300	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0200-0300	Egypt, Radio Cairo	9475na	11865na		
0200-0210 smtwhf	Finland, Radio	9560na	11755na		
0200-0250	Germany, Deutsche Welle	7285as	9615as	9690as	11945as
		11965as	13790as	15185as	15560as
0200-0300 as	Guam, KSDA Agana	13720as			
0200-0300	Hungary, Radio Budapest	9835na	11910na	15220na	
0200-0230 mtwhfa	Kenya, Voice of	4935do			
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do			
0200-0300	Namibia, Namibia BC Corp	3290af			
0200-0300	Netherlands, Radio	9860as	11655as	12025as	13700as
0200-0300	New Zealand, R NZ Intl	15120pa			
0200-0230 m	Norway, Radio Norway Intl	9565na	11925na		
0200-0300	Palau, KHBN	9830pa			
0200-0230	Philippines, FEBC Manila	15450as			
0200-0300	Romania, R Romania Intl	6155na	9510na	9570na	11830na
		11940na			
0200-0300	Russia, AWR	11835eu			
0200-0300	Russia, Radio Moscow	7150na	9480na	9685na	9765na
		9810na	11805am	12050na	15425na
		17570as	17655as	17835am	21625am
		21690as	21790as		
0200-0300	S Africa, Channel Africa	9730af			
0200-0300	Singapore, SBC1	5010do	5052do	11940do	

0200-0300	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0200-0230	Sweden, Radio	9695na	11705na		
0200-0230	Switzerland, Swiss R Intl	6135am	9650am	9885am	12035am
0200-0300	Taiwan, VO Free China	5950na	9680na	9765pa	11740ca
		11860as	15345na		
0200-0300	Thailand, Radio	9655as	11905as		
0200-0230	United Kingdom, BBC London	5975na	6005sa	6175na	6195eu
		7135me	7325am	9410eu	9590am
		9915am	11730af	11750sa	11955as
		12095na	15260sa	15310as	15360pa
		15380as	17790as	21715as	
0200-0300	USA, CS Monitor Boston MA	5850na	9350af	13760sa	
0200-0300 sa	USA, CS Monitor Boston MA	17555as	17865as		
0200-0230	USA, KCBI Dallas TX	9815am	15725am		
0200-0300	USA, KTNB Salt Lk City UT	7510am			
0200-0230 twhfa	USA, VOA Washington DC	5995am	7405am	9775am	11580am
		15120am	15205am		
0200-0300	USA, VOA Washington DC	7115as	7205as	7651as	9740as
		9775am	9775am	11580am	11705as
		15120am	15160am	15250as	17740as
		21550as			
0200-0300	USA, WHRI Noblesville IN	7315na			
0200-0300	USA, WINB Red Lion PA	15145eu			
0200-0300	USA, WJCR Upton KY	7490na	13595na		
0200-0300	USA, WRNO New Orleans LA		7355na		
0200-0300	USA, WYFR Okeechobee FL	5985am	6065am	9505am	15440am
0205-0238	Honduras, La Voz Mosquitia	4911do			
0205-0230 tes-vl	Moldova, Natl R of Moldov	7125na			
0230-0300	Albania, R Tirana Intl	9580na	11840na		
0230-0300 s	Kenya, Voice of	4935do			
0230-0245	Pakistan, Radio	9515as	17705as	17725as	21485as
		21730as			
0230-0300	Philippines, R Pilipinas	17760as	17840as	21580as	
0230-0300	United Kingdom, BBC London	5975na	6005sa	6175na	6195eu
		7135me	7325am	9410eu	9915am
		11730af	11750sa	11955as	12095na
		15260sa	15310as	15360pa	17790as
0230-0300	USA, KCBI Dallas TX	9815am	15725am		
0245-0300	India, All India Radio	3945as	7110as	11830as	15120as
		15220as			
0250-0300	Vatican State, Vatican R	9605na	11620na		

SELECTED PROGRAMS

Sundays

- 0205 Christian Science Monitor: Christian Science Sentinel. See S 0005.
 0210 Voice of America: VOA Morning. See S 0010.
 0230 BBC: Feature. Topical programming on various subjects.

Mondays

- 0205 Christian Science Monitor (am): The Sunday Service. See S 1605.
 0206 Christian Science Monitor (af): News Features And Interviews. See M 0006.
 0210 Voice of America: Newline. See S 2310.
 0230 BBC: Composer Of The Month. Profiles of famous classical composers.
 0230 Voice of America: VOA Morning. See S 0010.

Tuesdays

- 0206 Christian Science Monitor: News Features And Interviews. See M 0006.
 0210 Voice of America (am,ca): Focus. See M 1110.
 0210 Voice of America (as): Newline. See S 2310.
 0230 BBC: Quiz. See M 1215.
 0230 Voice of America (as): VOA Morning. See S 0010.

Wednesdays

- 0206 Christian Science Monitor: News Features And Interviews. See M 0006.
 0210 Voice of America (am,ca): Focus. See M 1110.
 0210 Voice of America (as): Newline. See S 2310.

- 0230 BBC: Development '93. Aid and development issues for developing nations.

- 0230 Voice of America (as): VOA Morning. See S 0010.

Thursdays

- 0206 Christian Science Monitor: News Features And Interviews. See M 0006.
 0210 Voice of America (am,ca): Focus. See M 1110.
 0210 Voice of America (as): Newline. See S 2310.
 0230 BBC: Sports International. Live play-by-play, interviews, features, and discussions from the sports world.
 0230 Voice of America (as): VOA Morning. See S 0010.

Fridays

- 0206 Christian Science Monitor: News Features And Interviews. See M 0006.

- 0210 Voice of America (am,ca): Focus. See M 1110.
 0210 Voice of America (as): Newline. See S 2310.
 0230 BBC: Drama. See H 1130.
 0230 Voice of America (as): VOA Morning. See S 0010.

Saturdays

- 0205 Christian Science Monitor: Christian Science Sentinel. See S 0005.
 0210 Voice of America (am,ca): Focus. See M 1110.
 0210 Voice of America (as): VOA Morning. See S 0010.
 0230 BBC: People And Politics. Background to the British political scene.

*The BBC Caribbean
Service team (l-r):
Hugh Crosskill,
Debra Ransome,
Tracey Robins and
Michael Jarvis.*



0300 UTC

[11:00 PM EDT/8:00 PM PDT]

FREQUENCIES

0300-0400	Australia, AAF Radio	17900af					0300-0400	Singapore, SBC1	5010do	5052do	11940do	
0300-0400	Australia, ABC Brisbane	4920do	9660do				0300-0400	Sri Lanka, SLBC Colombo	9720as	15425as		
0300-0400	Australia, ABC Perth	9610do					0300-0400	Taiwan, VO Free China	5950na	9680na	9765as	11740as
0300-0400	Australia, Radio	5880pa	15365as	17715pa	17750as				15345na			
		17795pa	17840pa	21595pa	21740pa		0300-0400	Tanzania, Radio	5985af	9685af	11765af	
0300-0400	Bulgaria, Radio	9050na	9850na	11765na			0300-0400	Thailand, Radio	9655as	11905as		
0300-0400	Canada, CFCX Montreal	6005do					0300-0350	Turkey, Voice of	9445na			
0300-0400	Canada, CFRX Toronto	6070do					0300-0330	United Kingdom,BBC London	3255af	5975na	6005va	6175na
0300-0400	Canada, CFVP Calgary	6030do							6180eu	6190af	6195me	7135me
0300-0400	Canada, CHNX Halifax	6130do							7230eu	7325am	9410eu	9600af
0300-0400	Canada, CKZU Vancouver	6160do							9915am	11730af	11750sa	11760me
0300-0400	China, China Radio Intl	9690na	9770na	11715na					11955me	12095va	15260sa	15310as
0300-0400	Costa Rica,Faro del Carib	9645na							15360pa			
0300-0400	Costa Rica,R forPeace Int	7375na	7385na	13630na	21465am		0300-0400	USA, CSMonitor Boston MA	5850na	9350af	13760sa	
0300-0400	Cuba, Radio Havana Cuba	6010na	9655na				0300-0400 sa	USA, CSMonitor Boston MA	17555as	17865as		
0300-0330	Czech Republic, R Prague	5930na	7345na	9485na	9810na		0300-0400	USA, KCBI Dallas TX	9815am			
		11990na					0300-0400	USA, KTVN Salt Lk City UT	7510am			
0300-0400	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am		0300-0400	USA, KVOH Los Angeles CA	9785sa			
0300-0330	Egypt, Radio Cairo	9475na	11865na				0300-0400	USA, VOA Washington DC	6065af	7265af	7280af	9715af
0300-0350	Germany, Deutsche Welle	6085na	6145na	9640na	9700na				9885af	11835af	11905me	15160me
		11810na	11890na	13610na	13770na				17810eu	17895me		
		13790na	15205na				0300-0400	USA, WEWN Birmingham AL	7425na			
0300-0400	Guatemala, Radio Cultural	3300do					0300-0400	USA, WHRI Noblesville IN	7315na			
0300-0400 m	Honduras, La Voz Evangel	4820do					0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400 sm	Honduras, R Luz y Vida	3250ca					0300-0400 vl	USA, WRNO New Orleans LA		7395am		
0300-0400	Hungary, Radio Budapest	11910na	15220na				0300-0400	USA, WYFR Okeechobee FL	6085am	7395na	9505am	9505am
0300-0330	Japan, NHK Tokyo	11725as	15320na	15325am			0300-0345	Vatican State, Vatican R	9605na	11620na	11625af	
0300-0400	Kenya, Voice of	4935do					0330-0400	Albania, R Tirana Intl	9580na	11825na		
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do					0330-0400	Austria, R Austria Intl	6015na	9880na		
0300-0400	Neth Antilles,TWR Bonaire	9535am	11930am				0330-0355 vl	India, All India Radio	7110as	15120as	15220as	
0300-0330	Netherlands, Radio	9860as	11655as	12025as	13700as		0330-0400	Japan, NHK Tokyo	15210as	15320na		
0300-0400	New Zealand, R NZ Intl	15120pa					0330-0400	Netherlands, Radio	6165na	9590na		
0300-0330 m	Norway, Radio Norway Intl	9560na	11865na				0330-0400	UAE, UAE Radio Dubai	11945na	13695eu	15320eu	15435na
0300-0400	Palau, KHDN	9830pa					0330-0400	United Kingdom,BBC London	3255af	5975na	6005af	6180eu
0300-0330	Philippines, R Pilipinas	17760as	17840as	21580as					6190af	6195eu	7230eu	9410eu
0300-0400	Russia, Radio Moscow	9480na	9530na	9765na	9810na				9600af	11730af	11760me	11955me
		9880na	11665as	11745na	11895as				12095va	15280as	15310as	15420af
		12050na	12070na	13650as	15220as				21715as			
		15375as	17590as	17650na	17655as		0340-0350 mtwhfa	Greece, Voice of	9395na	9420na	11645na	
		17755as	17835as	21625as			0345-0359 varies	Armenia, Radio Yerevan	11675na	11790na	13645am	15580na
0300-0400	S Africa, Channel Africa	9520af	9675af	9730af								
0300-0400	S Africa, Radio Oranie	3230do										

SELECTED PROGRAMS

Sundays

- 0305 Christian Science Monitor: Christian Science Sentinel. See S 0005
- 0310 Voice of America: VOA Morning. See S 0010.
- 0315 BBC: Sports Roundup. News from the world of sports.
- 0330 BBC: From Our Own Correspondent. Reporters comment on the background to the news.
- 0350 BBC: Write On... Listener letters, opinions, and questions.

Mondays

- 0306 Christian Science Monitor (af): Encore. See M 0106.
0310 Voice of America: Daybreak Africa. Correspondent reports,
news features, and background reports.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Anything Goes. See S 1430.
0334 Christian Science Monitor (af): Letterbox. See M 0134.
0347 Christian Science Monitor (af): Religious Article. See M
0147

Tuesdays

- 0306 Christian Science Monitor: Home Forum. See M 2306.
0310 Voice of America: Daybreak Africa. See M 0310.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: John Peel. Newly released albums and singles from the contemporary music scene.
0334 Christian Science Monitor: Letterbox. See M 0134.

- 0347 Christian Science Monitor: Religious Article. See M 0147.

Wednesdays

- 0306 Christian Science Monitor: Curtain Call. See T 2306.
0310 Voice of America: Daybreak Africa. See M 0310.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Discovery. An in-depth look at scientific research.
0334 Christian Science Monitor: Letterbox. See M 0134.
0347 Christian Science Monitor: Religious Article. See M 0147.

Thursdays

- 0306 Christian Science Monitor: Kaleidoscope. See W 2306.
0310 Voice of America: Daybreak Africa. See M 0310.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Assignment. A weekly examination of topical issues,
from Batman to bandits.
0334 Christian Science Monitor: Letterbox. See M 0134.
0347 Christian Science Monitor: Religious Article. See M 0147.

Fridays

- 0306 Christian Science Monitor: Arts Forum or Sportsworld. See H 2306.
0310 Voice of America: Daybreak Africa. See M 0310.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: Focus On Faith. Comment and discussion on major issues in the worlds of religion.
0334 Christian Science Monitor: Letterbox. See M 0134.
0347 Christian Science Monitor: Religious Article. See M 0147.

Saturdays

- 0305 Christian Science Monitor: Christian Science Sentinel. See S 0005.
0310 Voice of America: VOA Morning. See S 0010.
0315 BBC: Sports Roundup. See S 0315.
0330 BBC: The Vintage Chart Show. Paul Burnett presents classic Top 20 hits.

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0400 UTC

[12:00 AM EDT/9:00 PM PDT]

FREQUENCIES

0400-0500	Australia, AAF Radio	17900af				0400-0500	Singapore, SBC1	5010do	5052do	11940do	
0400-0500	Australia, ABC Brisbane	4920do	9660do			0400-0430	Sri Lanka, SLBC Colombo	9720as	15425as		
0400-0500	Australia, ABC Perth	9610do				0400-0430	Switzerland, Swiss R Intl	6135na	9860na	9885na	12035na
0400-0500	Australia, Radio	5880pa	15240pa	15320as	15365pa	0400-0430 mtwhf	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
		17670pa	17715pa	17750as	17795pa	0400-0430	Tanzania, Radio	5985af	9685af	11765af	
		17840as	21525as	21595as	21740as	0400-0430	Thailand, Radio	9655as	11905as		
0400-0404	Botswana, Radio	3356do	4830af	7255af		0400-0430	United Kingdom,BBC London	3955eu	5975na	6005af	6180eu
0400-0500	Canada, CFCX Montreal	6005do						6195eu	7230eu	9410eu	9600af
0400-0500	Canada, CFRX Toronto	6070do						11760me	11955me	12095va	15280as
0400-0500	Canada, CFCV Calgary	6030do						15310va	15575va	21715as	
0400-0500	Canada, CHNX Halifax	6130do				0400-0500	USA, CSMonitor Boston MA	9455am	9840af	13760sa	17780as
0400-0500	Canada, CKZU Vancouver	6160do				0400-0500 sa	USA, CSMonitor Boston MA	17555as			
0400-0429	Canada, RCI Montreal	11905me	15275me	15445me		0400-0500	USA, KCBI Dailas TX	9815am			
0400-0500	China, China Radio Intl	11840na				0400-0500	USA, KTVB Salt Lk City UT	7510am			
0400-0500	Costa Rica, R forPeace Int	7375na	7385na	13630na	15030am	0400-0500	USA, KVOH Los Angeles CA	9785am			
		21465am				0400-0500	USA, VOA Washington DC	5995me	6040me	6140me	6155af
0400-0430	Croatian Radio via WHRI	7315na	15105na					6873me	7170me	7405me	9715af
0400-0430	Cuba, Radio Havana Cuba	6010na	6180am	9655na	9815na			15752af			
0400-0430	Czech Republic, R Prague	7345na	9485na	9810na	11990na	0400-0430	USA, VOA Washington DC	6065af	6155af	7265af	7280af
		13715af	17535sa					7405af	9575af	9715af	9885af
0400-0430	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am			11835af			
0400-0450	Germany, Deutsche Welle	6015af	6130af	6145af	7150af	0400-0500	USA, WEWN Birmingham AL	7425na			
		7225af	9565af	9765af	11705af	0400-0500	USA, WHRI Noblesville IN	7315na	9495sa		
		11765af	13610af	13770af		0400-0500	USA, WJCR Upton KY	7490na	13595na		
0400-0430	Guatemala, Radio Cultural	3300do				0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
0400-0415 irreg	Iraq, Radio Iraq Intl	11860am				0400-0500	USA, WRNO New Orleans LA		7315am	7395am	
0400-0415	Israel, Kol Israel	9435na				0400-0500	USA, WYFR Okeechobee FL	6085am	9505am		
0400-0500	Kenya, Voice of	4935do				0425-0440	Italy, RAI Rome	5990eu	7275me		
0400-0500	Lebanon, King of Hope	11530as				0430-0500	Cuba, Radio Havana Cuba	6010na	6180na	9815na	
0400-0500 smtwh	Malaysia, RTM Radio 4	7295do				0430-0450 s	Finland, Radio	6120eu	9665eu		
0400-0430	Netherlands, Radio	6165na	9590na			0430-0500	Finland, Radio	11755me	15440af		
0400-0500	New Zealand, R NZ Intl	15120pa				0430-0500	Italy, AWR Europe	15125eu			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as		0430-0500	Nigeria, Radio	3326do	4770do		
0400-0430 m	Norway, Radio Norway Intl	9655na	9740na			0430-0500	Russia, AWR	15125eu			
0400-0500	Palau, KHBN	9830pa				0430-0500	Swaziland, TWR	5965af	9655af	11740af	
0400-0430	Romania, R Romania Intl	6155na	9510na	9570na	11830na	0430-0500	United Kingdom,BBC London	3955eu	5975na	6005af	6175eu
		11940na						6180eu	6190af	6195eu	9410eu
0400-0500	Russia, Radio Moscow	9480eu	9530eu	9610eu	9750eu			9600af	11760me	12095va	15280as
		9765eu	9880am	11630na	11790na			15310va	15400af	15575va	21470va
		12055am	12070am	13650am	13765eu			21715as			
		15220am	15280am	15420na	15500na	0430-0500	USA, VOA Washington DC	6035af	7265af	7280af	7405af
		17560am	17675am	17775am	17860am			9575af			
0400-0500	S Africa, Channel Africa	3995af	9695af			0435-0500 mtwhf	Namibia, Namibia BC Corp	4965af			
0400-0500 vi	S Africa, Radio Oranje	3230do				0445-0500 t	Sri Lanka, SLBC Colombo	9720na	15425na		
						0455-0500	Nigeria, Voice of	7255af			

SELECTED PROGRAMS

Sundays

- 0405 Christian Science Monitor: Christian Science Sentinel. See S 0005.
- 0410 Voice of America: VOA Morning. See S 0010.
- 0415 BBC: Feature. Stephen Hedges talks with top doctors about "Growing Points In Medicine" (through July 11th).
- 0430 BBC: Short Story. Stories written by listeners from around the world (except 6th: Seeing Stars, a monthly look at astronomy).
- 0445 BBC: Musical Feature. Pop-music trivia is the fare for host Mark Radcliffe on "Pop The Question" (through July 25th).

Mondays

- 0405 Christian Science Monitor (am): The Sunday Service. See S 1605.
- 0406 Christian Science Monitor (af,as): News Features And Interviews. See M 0006.
- 0410 Voice of America: Newslines. See S 2310.
- 0415 BBC: Talks. This month, Christopher Cook looks at English life from A to Zed in "An English Alphabet."
- 0430 BBC: Off The Shelf. This month: Margaret Atwood's chilling novel "The Handmaid's Tale" (1st-4th).
- 0430 Voice of America: VOA Morning. See S 0010.

- 0445 BBC: Andy Kershaw's World Of Music. New and unusual sounds from the world over.

Tuesdays

- 0406 Christian Science Monitor: News Features And Interviews.
See M 0006.
- 0410 Voice of America: Newslines. See S 2310.
- 0415 BBC: Health Matters. See T 0145.
- 0430 BBC: Off The Shelf. See M 0430.
- 0430 Voice of America: VOA Morning. See S 0010.
- 0445 BBC: Talks. See M 2315.

Wednesdays

- 0406 Christian Science Monitor: News Features And Interviews.
See M 0006.
- 0410 Voice of America: Newslines. See S 2310.
- 0415 BBC: Waveguide. Tips on how to hear the BBC better.
- 0425 BBC: Book Choice. A short review of a recently released book.
- 0430 BBC: Off The Shelf. See M 0430.
- 0430 Voice of America: VOA Morning. See S 0010.
- 0445 BBC: Country Style. See W 0145.

Thursdays

- 0406 Christian Science Monitor: News Features And Interviews.
See M 0006.
0410 Voice of America: Newslines. See S 2310.
0415 BBC: The Farming World. See H 0145.
0430 BBC: Off The Shelf. See M 0430.
0430 Voice of America: VOA Morning. See S 0010.
0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

- 0406 Christian Science Monitor: News Features And Interviews.
See M 0006.
- 0410 Voice of America: Newslines. See S 2310.
- 0415 BBC: Musical Feature. See M 0145.
- 0430 BBC: Off The Shelf. See M 0430.
- 0430 Voice of America: VOA Morning. See S 0010.
- 0445 BBC: Folk Routes. See T 0130.

Saturdays

- 0405 Christian Science Monitor: Christian Science Sentinel. See S 0005.
0410 Voice of America: VOA Morning. See S 0010.
0415 BBC: Good Books. See W 1445.
0430 BBC: Jazz Now And Then. See A 0145.
0445 BBC: Worldbrief. See F 2315.

0500 UTC

[1:00 AM EDT/10:00 PM PDT]

FREQUENCIES

0500-0600	Australia, ABC Brisbane	4920do	9660do		
0500-0600	Australia, ABC Perth	9610do			
0500-0530	Australia, Radio	15320pa	15365pa	17670pa	17715pa
		17795pa	21525pa	21595pa	21740pa
0500-0530	Canada, Can Force Network	6150eu			
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0529 mtwhf	Canada, RCI Montreal	6050eu	6150eu	7295eu	9750eu
		11775eu	17840eu		
0500-0600	China, China Radio Intl	11840am			
0500-0600	Costa Rica, R forPeace Int	7375na	7385na	13630na	15030na
0500-0515	Croatian Radio via WHRI	7315na	9495na		
0500-0600	Cuba, Radio Havana Cuba	9510na			
0500-0600	Ecuador, HCJB Quito	11925am	21455am		
0500-0550	Germany, Deutsche Welle	5960na	6130na	9515na	9605na
		9670na	11705na	13610na	
0500-0600 irreg	Italy, IRRS Milan	7125eu			
0500-0600	Japan, NHK Tokyo	6085me	7230eu	9725me	11725am
		11740am	15320na	15410am	17860am
		21610am			
0500-0600	Kenya, Voice of	4935do			
0500-0600	Lebanon, King of Hope	11530as			
0500-0505	Lesotho, Radio Lesotho	4800do			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600 mtwhf	Namibia, Namibia BC Corp	3270af	3290af		
0500-0600	New Zealand, R NZ Intl	15120pa			
0500-0600	Nigeria, Radio	3326do	4770do	4990do	
0500-0600	Nigeria, Voice of	7255af			
0500-0600	Palau, KHBN	9830pa			
0500-0600	Russia, Radio Moscow	9530eu	9610eu	9750eu	9765eu
		9880eu	11675eu	11765eu	11790eu
		12010af	13650af	15220eu	15280as
		15420as	15425eu	15470na	15510as
		15540af	15590af	17560af	17860af
0500-0600	S Africa, Channel Africa	11745af			
0500-0600 f	Seychelles, FEBA Radio	17750me			
0500-0600	Singapore, SBC1	5052do	11940do		
0500-0600	Spain, Spanish Natl Radio	9530na			
0500-0515 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0500-0530	Swaziland, TWR	5965af	9655af	11740af	

0500-0515 mtwhf	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0500-0600	Thailand, Radio	9655as	11905as		
0500-0530	United Kingdom, BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	9410va
		9600af	9640na	11760me	12095va
		15070me	15280as	15310va	15360va
		15400af	15420af	15575va	17830va
		17885af	21470va	21715as	
0500-0600	USA, CSMonitor Boston MA	9445na	9840af	13760sa	17780as
0500-0600 sa	USA, CSMonitor Boston MA	17555as			
0500-0600	USA, KCBI Dallas TX	9815am			
0500-0600	USA, KTNB Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9785am			
0500-0600	USA, VOA Washington DC	5995me	6035af	6040me	6060me
		6140me	6873me	7170me	7200me
		7405af	9530me	9575af	9635me
		9700me	9885af	11825me	11850af
		12080af	15115af	15205me	15600af
		7315na	9495na		
0500-0600	USA, WHRI Noblesville IN				
0500-0600	USA, WINB Red Lion PA	15145eu			
0500-0600	USA, WJCR Upton KY	7490na	13595na		
0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA		7395am	11580eu	11725eu
0500-0600	USA, WYFR Okeechobee FL	5985am	11580eu	11725eu	13695eu
0500-0520	Vatican State, Vatican R	6245eu	7250eu	11730af	
0510-0520 mtwhfa	Botswana, Radio	3356af	4830af	7255af	
0510-0600 vl	S Africa, Radio Oranje	7270do			
0524-0600 f	Ghana, GBC Radio 2	3366do			
0525-0600	Ghana, GBC Radio 1	4915do			
0530-0600	Australia, Radio	15240pa	15320pa	15365pa	17715pa
		17795pa	21525pa	21740pa	
0530-0600	Austria, R Austria Intl	6015na			
0530-0600	Romania, R Romania Intl	15380af	17720af	17745af	17790af
0530-0600	Swaziland, TWR	5965af	11740af		
0530-0600	UAE, UAE Radio Dubai	15435as	17830as	21700as	
0530-0600	United Kingdom, BBC London	3255af	3955eu	5975na	6005af
		6180eu	6190af	6195eu	9410va
		9600af	9640na	9750eu	11760me
		12095va	15070me	15280as	15310va
		15360va	15400af	15420af	15575va
		17830va	17885af	21470va	21715as
0530-0600	USA, WEWN Birmingham AL	7465am			

SELECTED PROGRAMS

Sundays

- 0505 Christian Science Monitor: Christian Science Sentinel. See S 0005.
 0510 Voice of America: VOA Morning. See S 0010.

Mondays

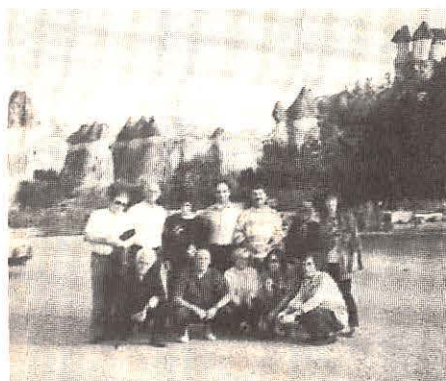
- 0506 Christian Science Monitor (af,as): Encore. See M 0106.
 0510 Voice of America: Newslines. See S 2310.
 0530 Voice of America: VOA Morning. See S 0010.
 0534 Christian Science Monitor (af,as): Letterbox. See M 0134.
 0547 Christian Science Monitor (af,as): Religious Article. See M 0147.

Tuesdays

- 0506 Christian Science Monitor: Home Forum. See M 2306.
 0510 Voice of America: Newslines. See S 2310.
 0530 Voice of America: VOA Morning. See S 0010.
 0534 Christian Science Monitor: Letterbox. See M 0134.
 0547 Christian Science Monitor: Religious Article. See M 0147.

Wednesdays

- 0506 Christian Science Monitor: Curtain Call. See T 2306.
 0510 Voice of America: Newslines. See S 2310.



This photo shows several winners of the Voice of Turkey Contest-'92 during their tour of the country.

- 0530 Voice of America: VOA Morning. See S 0010.
 0534 Christian Science Monitor: Letterbox. See M 0134.
 0547 Christian Science Monitor: Religious Article. See M 0147.

Thursdays

- 0506 Christian Science Monitor: Kaleidoscope. See W 2306.
 0510 Voice of America: Newslines. See S 2310.
 0530 Voice of America: VOA Morning. See S 0010.
 0534 Christian Science Monitor: Letterbox. See M 0134.
 0547 Christian Science Monitor: Religious Article. See M 0147.

Fridays

- 0506 Christian Science Monitor: Arts Forum or Sportsworld. See H 2306.
 0510 Voice of America: Newslines. See S 2310.
 0530 Voice of America: VOA Morning. See S 0010.
 0534 Christian Science Monitor: Letterbox. See M 0134.
 0547 Christian Science Monitor: Religious Article. See M 0147.

Saturdays

- 0505 Christian Science Monitor: Christian Science Sentinel. See S 0005.
 0510 Voice of America: VOA Morning. See S 0010.

0600 UTC

[2:00 AM EDT/11:00 PM PDT]

FREQUENCIES

0600-0700	Australia, ABC Perth	15425pa			
0600-0630	Australia, Radio	15240pa	15320as	15365pa	17715pa
		17760as	17880as	21525as	21595pa
		21740pa			
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0700	Costa Rica, R forPeace Int	7375na	7385na	13630am	15030na
		21465am			
0600-0700	Cuba, Radio Havana Cuba	6000na	9510na		
0600-0630	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
0600-0700	Ecuador, HCJB Quito	11925am	15155am	21455am	
0600-0630	Georgia, Georgian Radio	11805.3			
0600-0650	Germany, Deutsche Welle	11780af	13610af	13770af	13790af
		15185af	15205af	17875af	
0600-0700	Ghana, GBC Radio 1	4915do			
0600-0700 f	Ghana, GBC Radio 2	3366do			
0600-0700 irreg	Italy, IRRS Milan	7125eu			
0600-0625	Kenya, Voice of	4935do			
0600-0700	Kiribati, Radio	17440do			
0600-0630	Laos, National Radio of	7116as			
0600-0630 s	Latvia, Radio Riga	5935eu			
0600-0700	Lebanon, King of Hope	6280me			
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295as	
0600-0700	Malta, V of Mediterranean	9765eu			
0600-0700	Namibia, Namibia BC Corp	6175af			
0600-0658	New Zealand, R NZ Intl	15120pa			
0600-0700 s	New Zealand, ZLXA	3935do			
0600-0700	Nigeria, Radio	3326do	4770do	4990do	
0600-0700	Nigeria, Voice of	7255af			
0600-0650	North Korea, R Pyongyang	15180as	15230as		
0600-0700	Palau, KHBN	9830pa			
0600-0630	Romania, R Romania Intl	7225eu	9510eu	9665eu	11810eu
0600-0700	Russia, Radio Moscow	9750eu	9765eu	11765am	11985na
		12010af	12050af	12055am	12070eu
		13650am	15125am	15140na	15425na
		15470na	15500na	15540am	17860am
0600-0700	S Africa, Channel Africa	17710af			
0600-0700 vl	S Africa, Radio Oranje	9630do			
0600-0608 f	Seychelles, FEBA Radio	17750me			
0600-0700	Singapore, SBC1	5010do	5052do	11940do	
0600-0630	Solomon Islands, SIBC	9545pa			
0600-0700	South Korea, Radio Korea	7275na	11945na	15155na	
0600-0700	Swaziland, TWR	5965af	11740af		
0600-0615	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0600-0630	Switzerland, Swiss R Intl	13635af	15430af	17565af	
0600-0700 sa	Thailand, Radio	9655as	11905as		
0600-0630	United Kingdom, BBC London	3955eu	5975na	6180eu	6195eu
		7150pa	9410eu	9640va	11940af
		11955as	12095eu	15070va	15280as
		15310as	15360as	15400af	15575va
		15575me	17790as	17830va	21470me
		21715as			
0600-0700	USA, CSMonitor Boston MA	5850eu	9455na	9840eu	17555as
		17780as			
0600-0700	USA, KCBT Dallas TX	9815am			
0600-0700	USA, KTBN Salt Lk City UT	7510na			
0600-0700	USA, KVOH Los Angeles CA	9785na			
0600-0700	USA, VOA Washington DC	3980eu	5995eu	6005af	6035af
		6040eu	6060eu	6873eu	7110af
		7325me	7405af	9530af	9575af
		9635af	11925af	12080af	15600af
0600-0700	USA, WEWN Birmingham AL	7425na			
0600-0700	USA, WHRI Noblesville IN	7315eu	9495am		
0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	USA, WYFR Okeechobee FL	5985am	7355eu	11580af	11725eu
		15666eu			
0600-0610 mtwhfa	Vatican State, Vatican R	6245eu	7250eu	9645eu	11740eu
		15210eu			
0603-0610	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0625-0700	Kenya, Voice of	4935do			
0630-0700	Australia, Radio	11880pa	15240pa	15320as	15365pa
		17670as	17715pa	17880as	21525as
		21590as	21595pa	21740pa	
0630-0700	Austria, R Austria Intl	6015na			
0630-0655	Belgium, R Vlaanderen	5910eu	9925eu		
0630-0700 smtwhf	New Zealand, ZLXA	3935do			
0630-0700	United Kingdom, BBC London	5975na	6180eu	6195eu	7150pa
		9410eu	9640va	11760me	11955as
		12095me	15070va	15280as	15310as
		15360as	15400af	15575va	15575me
		17790as	17830pa	17885va	21470me
		21715as			
0630-0700	Vatican State, Vatican R	11625af	15090af	17730af	
0640-0700	Monaco, TWR Monte Carlo	9480eu			
0645-0700	Finland, Radio	6120af	9560me	11755eu	
0645-0700	Finland, Radio	6120eu	9560eu	11755eu	
0645-0700	Ghana, GBC	6130af			
0645-0715	Romania, R Romania Intl	11775pa	15250pa	15335pa	17720pa
		17805pa			
0650-0700	S Africa, Radio Oranje	9630do			

SELECTED PROGRAMS

Sundays

- 0605 Christian Science Monitor: Christian Science Sentinel. See S 0005.
- 0610 Voice of America: VOA Morning. See S 0010.
- 0615 BBC: Letter From America. Alistair Cooke shares his intimate view of American life.
- 0630 BBC: Jazz For The Asking. Digby Fairweather plays listener requests.

Mondays

- 0606 Christian Science Monitor: News Features And Interviews. See M 0006.
- 0610 Voice of America (af): Daybreak Africa. See M 0310.
- 0610 Voice of America (eu): Newline. See S 2310.
- 0615 BBC: Recording Of The Week. A personal choice of new classical music releases.
- 0630 BBC: Feature. See S 1401.
- 0630 Voice of America (eu): VOA Morning. See S 0010.

Tuesdays

- 0606 Christian Science Monitor: News Features And Interviews. See M 0006.

- 0610 Voice of America (af): Daybreak Africa. See M 0310.
- 0610 Voice of America (eu): Newline. See S 2310.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Rock/Pop Music. Tommy Vance returns with another hard-rocking series of "Rock Salad" (through July 6th).
- 0630 Voice of America (eu): VOA Morning. See S 0010.

Wednesdays

- 0606 Christian Science Monitor: News Features And Interviews. See M 0006.
- 0610 Voice of America (af): Daybreak Africa. See M 0310.
- 0610 Voice of America (eu): Newline. See S 2310.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Meridian. Events in the world of the arts.
- 0630 Voice of America (eu): VOA Morning. See S 0010.

Thursdays

- 0606 Christian Science Monitor: News Features And Interviews. See M 0006.
- 0610 Voice of America (af): Daybreak Africa. See M 0310.
- 0610 Voice of America (eu): Newline. See S 2310.

- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Sports International. See H 0230.
- 0630 Voice of America (eu): VOA Morning. See S 0010.

Fridays

- 0606 Christian Science Monitor: News Features And Interviews. See M 0006.
- 0610 Voice of America (af): Daybreak Africa. See M 0310.
- 0610 Voice of America (eu): Newline. See S 2310.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Meridian. See W 0630.
- 0630 Voice of America (eu): VOA Morning. See S 0010.

Saturdays

- 0605 Christian Science Monitor: Christian Science Sentinel. See S 0005.
- 0610 Voice of America: VOA Morning. See S 0010.
- 0615 BBC: The World Today. See M 1645.
- 0630 BBC: Meridian. See W 0630.

0700 UTC [3:00 AM EDT/12:00 AM PDT]

0700-0800	Australia, ABC Perth	15425pa			
0700-0730	Australia, Radio	6020pa	11720va	11880pa	15240pa
		15320va	15365pa	17715pa	17750as
		17795pa	21525pa	21595pa	21740pa
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, R forPeace Int	7375na	7385na	13630na	15030na
		21465am			
0700-0730	Ecuador, HCJB Quito	9600eu	11835eu	21455eu	
0700-0800	Ghana, GBC	6130af			
0700-0800	Ghana, GBC Radio 1	4915do			
0700-0800 f	Ghana, GBC Radio 2	3366do			
0700-0800 irreg	Italy, IRRS Milan	7125eu			
0700-0800	Japan, NHK Tokyo	6170as	7230au	11740au	15410au
		17860as	21575me	21610me	
0700-0800	Kenya, Voice of	4935do			
0700-0800	Lebanon, King of Hope	6280me			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800	Monaco, TWR Monte Carlo	9480eu			
0700-0800	New Zealand, R NZ Intl	9700pa			
0700-0800 smtwhf	New Zealand, ZXLA	3935do			
0700-0800	Nigeria, Radio	3326do	4990do		
0700-0750	North Korea, R Pyongyang	15350as	17765as		
0700-0800	Palau, KHBN	9830pa			
0700-0715	Romania, R Romania Intl	11810pa	11940pa	15335pa	17720pa
		17805pa	21665pa		
0700-0800	Russia, AWR	11835eu			
0700-0800	Russia, Radio Moscow	7345eu	9750eu	12020af	12070af
		13650me	13705va	15125me	15190va
		15280af	15345af	15420me	15440eu
		15465af	15470af	15520af	15540va
		15550af	17580eu	17655af	
0700-0800 vl	S Africa, Radio Oranje	9630do			
0700-0800	Singapore, SBC1	5010do	5052do	11940do	
0700-0800	Swaziland, TWR	7200af	11740af		
0700-0800	Taiwan, VO Free China	5950na			
0700-0800 sa	Thailand, Radio	9655as	11905as		
0700-0730	United Kingdom, BBC London	5975na	6190af	6195eu	7150pa
		7325af	9410eu	9640va	9760eu
		11760me	11940af	11955as	12095me
		15070va	15280as	15310as	15325eu
		15360pa	15400af	15420va	15575va
		17640me	17790va	17830as	17885af
		21470me	21660af	21715as	
0700-0800	USA, CSMonitor Boston MA	5850eu	7395am	9445na	9840va
		9870am	17555as	17780as	
0700-0800	USA, KCBI Dallas TX	9815am			
0700-0800	USA, KTNB Salt Lk City UT	7510na			
0700-0800	USA, KVOH Los Angeles CA	9785na			
0700-0800	USA, WHRI Noblesville IN	7315eu	9495am		
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WYFR Okeechobee FL	5985va	7355va	9680va	11915af
		13695eu			
0703-0715	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0730-0800	Australia, Radio	6020pa	11720pa	11880pa	15240pa
		17750as	17795pa	21525as	21590as
0730-0800	Austria, R Austria Intl	6155eu	13730eu	15450me	17870me
0730-0757	Czech Republic, R Prague	6055eu	11990pa	13600as	17535pa
		17725as	21705pa		
0730-0800	Ecuador, HCJB Quito	9745pa	11835eu	11925pa	15270eu
		21455eu			
0730-0745 mtwhf	Iceland, Natl BC Service	9265om			
0730-0735	India, All India Radio	15250as	17850as		
0730-0800	Italy, AWR Europe	7210eu			
0730-0800	Netherlands, Radio	9630pa	11895pa		
0730-0800	United Kingdom, BBC London	5975na	6190af	6195eu	7150au
		7325eu	9410eu	9640au	9760eu
		11760me	11955as	12095me	15070va
		15280as	15310as	15360as	15400af
		15420va	15575me	17640me	17790va
		17830as	17885af	21470me	21660af
		21715as			

0800 UTC [4:00 AM EDT/1:00 AM PDT]

0800-0900	Australia, ABC Brisbane	9660do			
0800-0900	Australia, ABC Perth	15425va			
0800-0830	Australia, Radio	5995pa	9560pa	9580pa	15240pa
		17750pa	21595as		
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Costa Rica, R forPeace Int	7375na	7385na	13630am	15030na
		21465na			
0800-0830	Ecuador, HCJB Quito	9600eu	9745pa	11835eu	11925pa
		17490au	21455eu		
0800-0900	Finland, Radio	17800as	21550as		
0800-0900	Ghana, GBC Radio 1	4915do			
0800-0900 f	Ghana, GBC Radio 2	3366do			
0800-0900 asmtwh	Guam, KTWR Agana	15200as			
0800-0900 irreg	Italy, IRRS Milan	7125eu			
0800-0900	Kenya, Voice of	4935do			
0800-0900	Lebanon, King of Hope	6280me			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0845	Monaco, TWR Monte Carlo	9480eu			
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0900 smtwhf	New Zealand, ZXLA	3935do			
0800-0900	Nigeria, Radio	3326do	4990do		
0800-0900	Nigeria, Voice of	7255af			
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0845	Pakistan, Radio	17900eu	21520eu		
0800-0900	Palau, KHBN	9830pa			
0800-0900 vl	Papua New Guinea, NBC	4890do			
0800-0900	Russia, Radio Moscow	11765af	12010as	12020as	12055af
		12070as	13650as	15125me	15190eu
		15225as	15345me	15420as	15440me
		15470as	17675af	17805af	21655af
0800-0900 vl	S Africa, Radio Oranje	9630do			
0800-0900	Singapore, SBC1	5010do	5052do	11940do	
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, Radio Korea	7550eu	13670eu		
0800-0820	Swaziland, TWR	7200af	11740af		
0800-0830	United Kingdom, BBC London	6190af	7325eu	9410eu	9640eu
		9660eu	9760eu	11940af	11955as
		12095me	15070va	15280as	15360as
		15420af	15575af	17640me	17705eu
		17790af	17790af	17830as	17885af
		21470af	21660af	21715pa	
0800-0900	USA, CSMonitor Boston MA	9455sa	9840eu	13615pa	15665pa
		17555as			
0800-0900	USA, KCBI Dallas TX	9815am			
0800-0900	USA, KNLS Anchor Point AK	9615as			
0800-0900	USA, KTNB Salt Lk City UT	7510am			
0800-0900	USA, VOA Washington DC	11735eu	15160eu	15195me	15410me
		17770me	21455me	21570me	
0800-0900	USA, WHRI Noblesville IN	7315am	7355am		
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0803-0805	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0820-0835 as	Swaziland, TWR	7200af	11740af		
0830-0900	Australia, Radio	5995na	9560pa	9580pa	17695pa
		21595pa	25750pa		
0830-0900	Austria, R Austria Intl	6155eu	13730eu		
0830-0900	Ecuador, HCJB Quito	9745pa	11925pa	21455pa	
0830-0900	India, All India Radio	7250as	9610as	11970as	15250as
		17850as			
0830-0900	Netherlands, Radio	11895pa			
0830-0857	Slovakia, Slovak Radio	11990au	15605au	17535au	21705au
0830-0900	United Kingdom, BBC London	6190af	7325eu	9410eu	9600eu
		9760eu	11940af	11955as	12095me
		15070va	15280as	15360pa	15420af
		15575af	17640me	17705eu	17790af
		17790af	17830as	17885af	21470af
		21660af	21715pa		
0830-0845	Vatican State, Vatican R	6245eu	7250eu	9645eu	15210eu
0835-0845 smtwhf	Monaco, TWR Monte Carlo	9480eu			
0840-0850	Greece, Voice of	15650au	17525au		
0850-0900 s	Monaco, TWR Monte Carlo	9480eu			

0900 UTC [5:00 AM EDT/2:00 AM PDT]

0900-1000	Australia, ABC Brisbane	4920do	9660do		
0900-1000	Australia, Radio	5995pa	9510pa	9580pa	13605as
		15170as	21725as		
0900-0925 mtwhf	Belgium, R Vlaanderen	5910eu	9905eu	13675eu	
0900-1000 s	Bhutan, BC Service	6035do			
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755au	15440au	17710au	
0900-0930	Costa Rica, R forPeace Int	7375am	7385am	13630am	15030am
		21465am			
0900-1000	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
0900-0950	Germany, Deutsche Welle	6160as	9565af	11715as	15410af
		17780as	17800af	17820as	21465as
		21600af	21650as	21680as	
0900-0905	Ghana, GBC Radio 1	4915do			
0900-0905 f	Ghana, GBC Radio 2	3366do			
0900-1000	Guam, KTWB Agana	11805pa			
0900-0910	India, All India Radio	9610as	11970as	15250as	17850as
0900-1000 s	Italy, AWR Europe	7230eu			
0900-1000 irreg	Italy, IRRS Milan	7125eu			
0900-1000	Japan, NHK Tokyo	9750pa	11740pa	11815pa	11910pa
		15190pa	17860pa		
0900-1000	Kenya, Voice of	4935do			
0900-1000	Lebanon, King of Hope	6280me			
0900-1000	Malaysia, RTM Radio 4	7295do			
0900-0915 s	Monaco, TWR Monte Carlo	9480eu			
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-0930 mtwhf	New Zealand, ZLXA	9335do			
0900-1000	Nigeria, Radio	3326do	4990do		
0900-1000	Nigeria, Voice of	7255af			
0900-1000	Palau, KHBN	9830pa			
0900-1000 vi	Papua New Guinea, NBC	4890do			
0900-1000	Philippines, FEBC Manila	11690as			
0900-1000	Russia, Radio Moscow	7130af	9755af	11765af	12010as
		12020as	12055af	12070as	13650as
		15190eu	15345me	15420as	15440af
		15470as	15525as	17675af	17805af
		21655af	21825af		
0900-1000 vi	S Africa, Radio Oranje	9630do			
0900-1000	Singapore, SBC1	5010do	5052do	11940do	
0900-0930	Switzerland, Swiss R Intl	9885au	13685au	17670au	21820au
0900-0930	United Kingdom, BBC London	6190af	6195as	9410eu	9660eu
		9740va	9750eu	9760eu	11750as
		11760me	11940af	12095me	15070me
		15190sa	15310as	15400af	15420af
		15575va	17640me	17705va	17790va
		17830as	17885af	21470af	21660af
		21715pa			
0900-1000	USA, CSMonitor Boston MA	9455sa	9840eu	13615pa	15665pa
		17555as			
0900-1000	USA, KCBI Dallas TX	9815am			
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, VOA Washington DC	11735eu	15160eu	15195me	17770eu
		21455me	21570eu		
0900-1000	USA, WHRI Noblesville IN	7315am	7355am		
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0905-1000 sa	Ghana, GBC Radio 1	4915do			
0905-1000 mtwhf	Ghana, GBC Radio 2	3366do	7295do		
0905-1000 sa	Ghana, GBC Radio 2	3366do			
0910-0940 smwha	Mongolia, R Ulaanbaatar	11850pa	12015pa		
0915-0930 smtwh	Guam, KTWB Agana	15200as			
0930-0945	India, All India Radio	9610as	11970as	15250as	17850as
0930-1000	Netherlands, Radio	9720pa	11895pa	12065as	15470as
0930-1000	Slovakia, Slovak Radio	7345eu	9505eu	11990eu	
0930-1000	United Kingdom, BBC London	6190af	6195as	9410eu	9660eu
		9740va	9750eu	9760eu	11750as
		11760me	11940af	12095me	15070me
		15190sa	15310as	15400af	15420af
		15575va	17640me	17705eu	17790va
		17830va	17885af	21470af	21660af
		21715pa			
0940-0950	Greece, Voice of	17525au			

1000 UTC [6:00 AM EDT/3:00 AM PDT]

1000-1100	Australia, Radio	5995pa	9580pa	13605pa	21725as
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755au	15440au	17710au	
1000-1100	Costa Rica, AWR Alajuela	9725ca			
1000-1100	Costa Rica, R forPeace Int	7375na	7385na	13630na	15030na
		21465na			
1000-1100	Ecuador, HCJB Quito	9745pa	11925pa	17490pa	21455pa
1000-1100 sa	Ghana, GBC Radio 1	4915do			
1000-1100 mtwhf	Ghana, GBC Radio 2	7295do			
1000-1100 sa	Ghana, GBC Radio 2	3366do			
1000-1100	India, All India Radio	15050as	17387as	17895as	21735as
1000-1030	Israel, Kol Israel	17545eu			
1000-1100	Italy, AWR Europe	7230eu			
1000-1100 irreg	Italy, IRRS Milan	7125eu			
1000-1100	Kenya, Voice of	4935do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100	Nigeria, Radio	4990do	7285do		
1000-1100	Nigeria, Voice of	7255af			
1000-1100	Palau, KHBN	9830pa			
1000-1100	Philippines, FEBC Manila	9800as	11685as		
1000-1100	Russia, Radio Moscow	11630eu	11655eu	11765af	11940af
		12010eu	12020eu	12070eu	15125me
		15140eu	15350me	15355eu	15470eu
		15490as	17595as	17675af	17775as
		17805af	21655af		
1000-1100	S Africa, Channel Africa	17805af			
1000-1100 vi	S Africa, Radio Oranje	9630do			
1000-1100	Singapore, SBC1	5010do	5052do	11940do	
1000-1045	Switzerland, Swiss R Intl	6165eu	9535eu		
1000-1030	United Kingdom, BBC London	6190af	6195va	9410va	9660eu
		9740va	9750eu	9760eu	11750as
		11760me	11940af	12095eu	15070va
		15190am	15260sa	15310as	15400af
		15420af	15575va	17640va	17705eu
		17790va	17830pa	17885af	21470va
		21660af	21715pa		
1000-1100	USA, CSMonitor Boston MA	9455sa	9495na	13625as	17555as
1000-1100	USA, KCBI Dallas TX	9815am			
1000-1100	USA, VOA Washington DC	5985pa	7405am	9590am	11720as
		11735me	11915am	15120am	15160me
		15195me	15425as	17770me	21455me
1000-1100	USA, WHRI Noblesville IN	7315am	7355am	9850am	
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WYFR Okeechobee FL	5950am			
1000-1015 mtwhfa	Vatican State, Vatican R	6245eu	7250eu	11740eu	15210eu
		21665eu			
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1003-1006	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
1030-1100	Austria, R Austria Intl	15450au	21490au		
1030-1100	Bulgaria, Radio	13670eu	17660eu	17830eu	
1030-1057	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
		15355eu			
1030-1100	Iran, VOIRI Tehran	9525as	11715af	11790as	11910as
		11930me			
1030-1100	South Korea, Radio Korea	11715na			
1030-1100	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1030-1100	UAE, UAE Radio Dubai	13675eu	15320eu	15435eu	21605eu
1030-1100	United Kingdom, BBC London	6190af	6195va	9410va	9660eu
		9740va	9750eu	9760eu	11750as
		11760me	11940af	12095eu	15070va
		15190am	15260sa	15310as	15400af
		15420af	15575va	17640va	17705eu
		17790va	17885af	21470va	21660af
		15650as	17525as		
1040-1050	Greece, Voice of	11815am	15345am		
1055-1100	Neth Antilles, TWR Bonaire				

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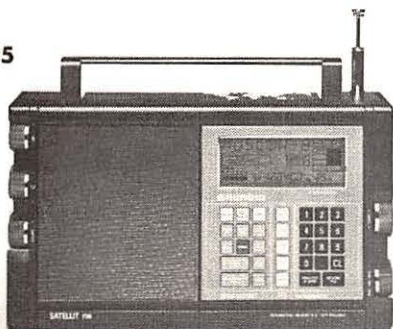


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1100 UTC

[7:00 AM EDT/4:00 AM PDT]

FREQUENCIES

1100-1200	Australia, ABC Brisbane	4920do				1100-1200	South Korea, Radio Korea	6145na	9650na		
1100-1200	Australia, Radio	6080pa	7240pa	9510pa	9580pa	1100-1130	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
		9910pa	15170pa		21725pa	1100-1130	Switzerland, Swiss R Intl	13635as	15505as	17670as	17670as
1100-1200	Bulgaria, Radio	13670eu	17660eu	17830eu				21820as			
1100-1200	Canada, CFCX Montreal	6005do				1100-1200	Taiwan, Voice of Asia	7445as			
1100-1200	Canada, CFRX Toronto	6070do				1100-1130	United Kingdom,BBC London	5965na	6190af	6195va	9410eu
1100-1200	Canada, CFVP Calgary	6030do						9515na	9600eu	9700au	9740va
1100-1200	Canada, CHNX Halifax	6130do						9750eu	9760eu	11750as	11760me
1100-1200	Canada, CKZU Vancouver	6160do						11940af	12095eu	15070va	15220na
1100-1200	Costa Rica, AWR Alajuela	9722ca	11870ca					15310as	15400eu	15420af	15575me
1100-1200	Costa Rica,R forPeace Int	7375na	7385na	13630na	15030na			17640va	17705eu	17790af	17885va
		21465na						21470va	21660af		
1100-1130	Ecuador, HCJB Quito	9745pa	11925pa	21455pa		1100-1200	USA, CSMonitor Boston MA	9455sa	9495na	13625as	17555as
1100-1150	Germany, Deutsche Welle	15370af	15410af	17715af	17765af	1100-1200	USA, KCBI Dallas TX	9815am			
		17800af	17860af	21465af	21600af	1100-1200	USA, KTVN Salt Lk City UT	7510na			
1100-1200	Ghana, GBC Radio 1	4915do				1100-1200	USA, VOA Washington DC	5985as	6110as	7405am	9590am
1100-1110 mtwhf	Ghana, GBC Radio 2	7295do						9760as	11720as	11915am	15120am
1100-1200 sa	Ghana, GBC Radio 2	3366do						15160as	15425as		
1100-1130	Iran, VOIRI Tehran	9525af	11515af	11790as	11910as	1100-1200	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
		11930me				1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200 irreg	Italy, IRRS Milan	7125eu				1100-1200	USA, WYFR Okeechobee FL	5950na	7355na	11830na	
1100-1200	Japan, NHK Tokyo	6120na	11910na	15240na	21610as	1100-1130	Vietnam, Voice of	7287as	9730as		
1100-1200	Malaysia, RTM Radio 4	7295do				1115-1145	Nepal, Radio	3230as	5005as	7165as	
1100-1130	Mozambique, R Mocambique	11820af	11835af			1130-1200	Austria, R Austria Intl	6155eu	13730eu		
1100-1200	Neth Antilles,TWR Bonaire	11815am	15345am			1130-1155	Belgium, R Vlaanderen	15530na	17540as		
1100-1125	Netherlands, Radio	12065as	15470as			1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1100-1200	New Zealand, R NZ Intl	9700as				1130-1150 mtwhf	Finland, Radio	11735na	15400na		
1100-1150	North Korea, R Pyongyang	6576na	9977na	11335na		1130-1200	Netherlands, Radio	5955eu	9860eu		
1100-1120	Pakistan, Radio	17595eu	17900eu	21520eu		1130-1200	Serbia, Radio Yugoslavia	21605au			
1100-1200	Palau, KHBN	9830pa				1130-1200	Thailand, Radio	4830as	9655as	11905as	
1100-1200	Russia, Radio Moscow	11765me	12020na	13650na	15125as	1130-1200	United Kingdom,BBC London	5965na	6190af	6195va	9410eu
		15130as	15140me	15225me	15320as			9515na	9600eu	9740va	9750eu
		15355me	15405as	15420as	15490me			9760eu	11750as	11760me	11940af
		15540as	15750na	17595me	17675me			12095eu	15070va	15220na	15310as
		17755na	17780me	17815as	17875as			15420af	15575me	17640af	17705eu
								17790af	17885va	21470va	21660af
1100-1200	S Africa, Channel Africa	9730af				1135-1140	India, All India Radio	9675as	11770as	11970as	17705as
1100-1200 vl	S Africa, Radio Oranje	9630do						17815as			
1100-1200	Singapore, SBC1	5010do	5052do	11940do							

SELECTED PROGRAMS

Sundays

- 1105 Christian Science Monitor: Christian Science Sentinel.
See S 0005.
- 1110 Voice of America (as): New Horizons. The world of
science, medicine, and technology.
- 1110 Voice of America (ca): Critic's Choice. News from the
world of the arts.
- 1130 BBC: The Ken Bruce Show. See S 0030.
- 1130 Voice of America (as): Issues In The News. Members of
the Washington press corps discuss current topics.
- 1130 Voice of America (ca): Studio One. Dramatized and
narrative documentaries.

Mondays

- 1106 Christian Science Monitor: Encore. See M 0106.
1110 Voice of America (as): This Is America (Special English).
A look at various unique aspects of American culture.
1110 Voice of America (ca): Focus. A look at the major figures
and issues that shape contemporary life.
1130 BBC: Composer Of The Month. See M 0230.
1130 Voice of America (as): Music, UA. (Standards). Classics
of American popular music.
1130 Voice of America (ca): VOA Morning. See S 0010.
1134 Christian Science Monitor: Letterbox. See M 0134.
1147 Christian Science Monitor: Religious Article. See M 0147.

Tuesdays

- 1106 Christian Science Monitor: Home Forum. See M 2306.
1110 Voice of America (as) (Special English): Agriculture
Report. Developments in agriculture.
1110 Voice of America (ca): Focus. See M 1110.

- 1115 Voice of America (as) (Special English): Science In The
News. The role of science in everyday life.
- 1130 BBC: Megamix. Music, sports, fashion, health, travel,
news, and opinion for young people.
- 1130 Voice of America (as): Now Music. UA. Rock and soul
music from old favorites to the latest hits, and profiles of
the stars.
- 1130 Voice of America (ca): VOA Morning. See S 0010.
- 1134 Christian Science Monitor: Letterbox. See M 0134.
- 1147 Christian Science Monitor: Religious Article. See M 0147.

Wednesdays

- 1106 Christian Science Monitor: Curtain Call. See T 2306.
1110 Voice of America (as): Science Report (Special English).
See M 0040.
1110 Voice of America (ca): Focus. See M 1110.
1115 Voice of America (as): Space And Man (Special English).
Various aspects of life in space.
1130 BBC: Meridian. See W 0630.
1130 Voice of America (as): Now Music, UA. See T 1130.
1130 Voice of America (ca): VOA Morning. See S 0010.
1134 Christian Science Monitor: Letterbox. See M 0134.
1147 Christian Science Monitor: Religious Article. See M 0147.

Thursdays

- 1106 Christian Science Monitor: Kaleidoscope. See W 2306.
1110 Voice of America (as): Science Report (Special English).
See M 0040
1110 Voice of America (ca): Focus. See M 1110.
1115 Voice of America (as): The Making Of A Nation (Special
English). See H 0045.
1130 BBC: Drama: A half-hour production from the BBC's

- crack drama team.
1130 Voice of America (as): Now Music, UA. See T 1130.
1130 Voice of America (ca): VOA Morning. See S 0010.
1134 Christian Science Monitor: Letterbox. See M 0134.
1147 Christian Science Monitor: Religious Article. See M 0147.

Fridays

- | | |
|------|---|
| 1106 | Christian Science Monitor: Arts Forum or Sportsworld.
See H 2306. |
| 1110 | Voice of America (as): Science Report (Special English).
See M 0040. |
| 1110 | Voice of America (ca): Focus. See M 1110. |
| 1115 | Voice of America (as): American Mosaic (Special English). A feature program in s-l-o-w English. |
| 1130 | BBC: Meridian. See W 0630. |
| 1130 | Voice of America (as): Country Music, UA. Current popular country music tunes with a sprinkling of old favorites. |
| 1130 | Voice of America (ca): VOA Morning. See S 0010. |
| 1134 | Christian Science Monitor: Letterbox. See M 0134. |
| 1147 | Christian Science Monitor: Religious Article. See M 0147. |

Saturdays

- 1105 Christian Science Monitor: Christian Science Sentinel. See S 0005.
1110 Voice of America: Agriculture Today. Developments in agriculture.
1130 BBC: Meridian. See W 0630.
1130 Voice of America (as). Press Conference, UA. See S 0130.
1130 Voice of America (ca). Music, UA. (Standards). See M 1130.

1200 UTC

[8:00 AM EDT/5:00 AM PDT]

FREQUENCIES

1200-1300	Australia, ABC Brisbane	4920do			
1200-1300	Australia, ABC Katherine	2485do			
1200-1300	Australia, ABC Perth	5140do	9610do		
1200-1230	Australia, Radio	5995pa	6020pa	6080pa	7240pa
		9580pa	9710pa	21725as	
1200-1300	Brazil, Radiobras	15445am			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1259 mtwhf	Canada, RCI Montreal	9635na	11855na	17820na	
1200-1300	China, China Radio Intl	9715as	11660as	11795pa	15210na
		15440pa	15450pa		
1200-1300	Costa Rica, AWR Alajuela	9725ca	11870ca		
1200-1300	Costa Rica, R for Peace Int	7375na	7385am	13630na	15030na
		21465am			
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17490am	17890am
		21455om			
1200-1300	Ghana, GBC Radio 1	4915do			
1200-1225 sa	Ghana, GBC Radio 2	3366do			
1200-1300 irreg	Italy, IRRS Milan	7125eu			
1200-1300	Kenya, Voice of	4935do			
1200-1300	Malaysia, RTM Radio 4	7295do			
1200-1230 smwha	Mongolia, R Ulaanbaatar	11850as	12015as		
1200-1230	Neth Antilles, TWR Bonaire	11815am	15345am		
1200-1206	New Zealand, R NZ Intl	9700as			
1200-1300	Nigeria, Radio	4990do	7285do		
1200-1300	Nigeria, Voice of	7255af			
1200-1230 m	Norway, Radio Norway Intl	17730as	17860as		
1200-1300	Palau, KHBN	9830pa			
1200-1300	Russia, AWR	11835eu			
1200-1300	Russia, Radio Moscow	11765af	11785af	15140as	15155as
		15225as	15280na	15290as	15320me
		15355as	15440me	15480as	15490na
		15540na	17590na	17645na	17670na
		17675af	17735me	17765me	17815me
1200-1300 vl	S Africa, Radio Oranje	9630do			
1200-1300	Singapore, SBC1	5010do	5052do	11940do	
1200-1230	South Korea, Radio Korea	9650na			
1200-1230	Thailand, Radio	9655as	11905as		

1200-1230	United Kingdom, BBC London	6190af	6195na	9410eu	9515na
		9660eu	9740as	9750eu	9760eu
		11750as	11760me	11940af	12095eu
		15070va	15220na	15260sa	15310as
		15575va	17640af	17705eu	17790af
		17885af	21470af	21660af	
1200-1300	USA, CS Monitor Boston MA	9425pa	9495na	13625as	13760sa
1200-1300 as	USA, CS Monitor Boston MA	15665eu			
1200-1300	USA, KCBI Dallas TX	9815am			
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, VOA Washington DC	6110as	9760as	11715as	15160as
		15425as			
1200-1300	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300	USA, WYFR Okeechobee FL	5950am	6015am	11830am	17750am
1200-1230	Uzbekistan, R Tashkent	7325as	9715as	15295as	17745as
1207-1300 ocasnal	New Zealand, R NZ Intl	9510as			
1210-1300	Finland, Radio	15400na	21550na		
1215-1300	Egypt, Radio Cairo	17595as			
1215-1300	South Korea, Radio Korea	9750am			
1226-1300	Ghana, GBC Radio 2	7295do			
1230-1300	Australia, Radio	5995pa	6020pa	7150pa	7240pa
		9580pa	21725pa		
1230-1300	Bangladesh, Radio	11708eu	13620eu	15200eu	
1230-1259	Canada, RCI Montreal	9660as	15195as		
1230-1255	France, Radio France Intl	9805eu	11670eu	15155eu	15195eu
		15365na	21645na		
1230-1235	India, All India Radio	4860do	17850as		
1230-1300	Netherlands, Radio	5955eu	9860eu		
1230-1300	Sri Lanka, SLBC Colombo	6075as	9720as		
1230-1300	Sweden, Radio	15240pa	21500as		
1230-1300	Turkey, Voice of	9675as			
1230-1300	United Kingdom, BBC London	6190af	6195na	9410eu	9515na
		9660eu	9740as	9750eu	9760eu
		11750as	11760me	11940af	12095eu
		15070va	15220na	15260sa	15310as
		15575va	17640af	17705eu	17790af
		17885af	21470af	21660af	
1230-1300	Vietnam, Voice of	9840as	12020as	15010as	
1235-1245	Greece, Voice of	15635na	15650na	17515na	

SELECTED PROGRAMS

Sundays

- 1201 BBC: Play Of The Week. See S 0101.
 1205 Christian Science Monitor: Christian Science Sentinel. See S 0005.
 1210 Voice of America: Encounter. A discussion program presenting opinions on world issues.
 1230 Voice of America: Studio One. See S 1130.

Mondays

- 1206 Christian Science Monitor: News Features And Interviews. See M 0006.
 1209 BBC: Words Of Faith. Speakers from various faiths discuss scripture and their beliefs.
 1210 Voice of America: Newline. See S 2310.
 1215 BBC: Quiz. Robert Robinson continues the quest to find the "Brain Of Britain" (through September 6th).
 1230 Voice of America: Magazine Show. Features about culture, science, sports, medicine, and the arts in America.
 1245 BBC: Sports Roundup. See S 0315.

Tuesdays

- 1206 Christian Science Monitor: News Features And Interviews. See M 0006.
 1209 BBC: Words Of Faith. See M 1209.
 1210 Voice of America: Newline. See S 2310.
 1215 BBC: Multitrack 1. See M 2330.

- 1230 Voice of America: Magazine Show. See M 1230.
 1245 BBC: Sports Roundup. See S 0315.

Wednesdays

- 1206 Christian Science Monitor: News Features And Interviews. See M 0006.
 1209 BBC: Words Of Faith. See M 1209.
 1210 Voice of America: Newline. See S 2310.
 1215 BBC: New Ideas. See M 1615.
 1230 Voice of America: Magazine Show. See M 1230.
 1235 BBC: Talks. See M 1635.
 1245 BBC: Sports Roundup. See S 0315.

Thursdays

- 1206 Christian Science Monitor: News Features And Interviews. See M 0006.

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- 1209 BBC: Words Of Faith. See M 1209.
 1210 Voice of America: Newline. See S 2310.
 1215 BBC: Multitrack 2. See W 2330.
 1230 Voice of America: Magazine Show. See M 1230.
 1245 BBC: Sports Roundup. See S 0315.

Fridays

- 1206 Christian Science Monitor: News Features And Interviews. See M 0006.
 1209 BBC: Words Of Faith. See M 1209.
 1210 Voice of America: Newline. See S 2310.
 1215 BBC: Feature. Gabriel Partos examines the Cold War era in "The World That Came In From The Cold" (through July 9th).
 1230 Voice of America: Magazine Show. See M 1230.
 1245 BBC: Sports Roundup. See S 0315.

Saturdays

- 1205 Christian Science Monitor: Christian Science Sentinel. See S 0005.
 1209 BBC: Words Of Faith. See M 1209.
 1210 Voice of America: Communications World. See S 0110.
 1215 BBC: Multitrack 3. See F 2330.
 1230 Voice of America: Weekend Magazine. See S 0030.
 1245 BBC: Sports Roundup. See S 0315.

1300 UTC

[9:00 AM EDT/6:00 AM PDT]

FREQUENCIES

1300-1400	Australia, ABC Alice Sprg	2310do			
1300-1400	Australia, ABC Brisbane	4920do			
1300-1400	Australia, ABC Katherine	2485do			
1300-1400	Australia, ABC Perth	9610do			
1300-1400	Australia, ABC Tennant Cr	2325do			
1300-1400	Australia, Radio	5995pa	7240pa	9580pa	11800pa
		11855as	13755as		
1300-1330 mtwtf	Belgium, R Vlaanderen	15530na	17540as		
1300-1320	Brazil, Radiobras	15445am			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFPV Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 mtwtf	Canada, RCI Montreal	9635na	11855na	17820am	
1300-1400 s	Canada, RCI Montreal	11955na	17820na		
1300-1400	China, China Radio Intl	9715as	11660pa	15440pa	
1300-1400	Costa Rica, R forPeace Int	7375am	7385am	13630na	15030na
		21465am			
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17490va	17890am
		21455am			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400 as	Finland, Radio	15400na	21550na		
1300-1330	Finland, Radio	15400na	21550na		
1300-1325	Israel, Kol Israel	11587na	11603na	15640na	15650as
		17575eu	17590eu		
1300-1325	Kenya, Voice of	4935do			
1300-1400	Lebanon, Wings of Hope	11530me			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1400	Nigeria, Radio	4990do	7285do		
1300-1400	Nigeria, Voice of	7255af			
1300-1350	North Korea, R Pyongyang	9345eu	9640as	13760am	15230as
1300-1330 m	Norway, Radio Norway Intl	9590eu	15230eu		
1300-1400	Palau, KHBN	9830pa			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1355	Poland, Polish R Warsaw	6135eu	7145eu	9525eu	11815eu
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	17850eu
1300-1400	Russia, Radio Moscow	15140me	15225as	15280as	15320as
		15355me	15480as	15510as	17595as
		17860me	21610as	21625me	21785me
1300-1400 vl	S Africa, Radio Oranje	9630do			
1300-1400	Singapore, SBC1	5010do	5052do	11940do	
1300-1315	South Korea, Radio Korea	9750na	13670na		
1300-1400	Sri Lanka, SLBC Colombo	6075as	9720as		
1300-1330	Switzerland, Swiss R Intl	7480as	11690as	13635as	15505as

		17670as	21820as		
1300-1330	United Kingdom,BBC London	6190af	6195va	7180pa	9410eu
		9515na	9660eu	9740va	9750eu
		9760eu	11750as	11760me	11820va
		11940af	12095eu	15070va	15105af
		15220am	15310as	15420af	15575me
		17640va	17705eu	17790va	17885af
		21470va	21660af		
1300-1400	USA, CSMonitor Boston MA	9425pa	9495na	13625as	13760sa
1300-1400 as	USA, CSMonitor Boston MA	15665eu			
1300-1400	USA, KCBJ Dallas TX	9815am			
1300-1400	USA, KNLS Anchor Point AK	9615as			
1300-1400	USA, KTVN Salt Lk City UT	7510am			
1300-1330	USA, VOA Washington DC	6110as	9760as	11715as	15160as
		15425as			
1300-1400	USA, WEWN Birmingham AL	9350na			
1300-1400	USA, WHRI Noblesville IN	9465na	11790na		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	USA, WYFR Okeechobee FL	5950na	6015na	11830na	13695na
		17750na			
1302-1400	Taiwan, VOFC via WYFR	11550as			
1320-1400	Jordan, Radio	9560eu			
1325-1400 mtwhf	Kenya, Voice of	4935do			
1330-1400	Austria, R Austria Intl	15450as			
1330-1359	Canada, RCI Montreal	9535as	11795as	11935eu	15315eu
		15325eu	17820eu	17895af	21455eu
		21710eu			
1330-1400 mtwhf	Finland, Radio	15400na	21550na		
1330-1400	India, All India Radio	9665as	11760as	15120as	
1330-1400	Laos, National Radio of	7116as			
1330-1400	Netherlands, Radio	9890as	13700as	15150as	17610as
1330-1400	UAE, UAE Radio Dubai	13675eu	15320eu	15435as	21605as
1330-1400	United Kingdom,BBC London	6190af	6195va	7180pa	9410eu
		9515na	9660eu	9740va	9750eu
		9760eu	11750as	11760me	11820va
		11940af	12095eu	15070va	15220am
		15310as	15420af	15575me	17640va
		17705eu	17790va	17885af	21470va
		21660af			
1330-1400	USA, VOA Washington DC	6110as	9760as	15155au	15425au
1330-1400	Uzbekhistan, R Tashkent	7325as	9715as	15295as	17745as
1330-1400	Vietnam, Voice of	9840as	15009as		
1335-1345	Greece, Voice of	15635eu	17515eu		
1345-1400	Vatican State, Vatican R	15090as	17525as		

SELECTED PROGRAMS

Sundays

- 1305 Christian Science Monitor; Christian Science Sentinel. See
S 0005.
- 1310 Voice of America: Critic's Choice. News from the world of the
arts.
- 1340 Voice of America: Words And Their Stories (Special En-
glish). See S 0040.
- 1345 Voice of America: Tuning In The USA (Special English). A
feature program in s-l-o-w English.

Mondays

- 1306 Christian Science Monitor: Encore. See M 0106.
1310 Voice of America: Focus. See M 1110.
1334 Christian Science Monitor: Letterbox. See M 0134.
1340 Voice of America: Development Report (Special English).
No details available.
1345 Voice of America: This Is America (Special English). See M
1115.
1347 Christian Science Monitor: Religious Article. See M 0147.

Tuesdays

- 1306 Christian Science Monitor: Home Forum. See M 2306.
1310 Voice of America: Focus. See M 1110.

- 1334 Christian Science Monitor: Letterbox. See M 0134.
1340 Voice of America (Special English): Agriculture Report. See
T 1110.
1345 Voice of America (Special English): Science In The News.
See T 1115.
1347 Christian Science Monitor: Religious Article. See M 0147.

Wednesdays

- 1306 Christian Science Monitor: Curtain Call. See T 2306.
1310 Voice of America: Focus. See M 1110.
1334 Christian Science Monitor: Letterbox. See M 0134.
1340 Voice of America: Science Report (Special English). See M 0040.
1345 Voice of America: Space And Man (Special English). See W 1115.
1347 Christian Science Monitor: Religious Article. See M 0147.

Thursdays

- 1306 Christian Science Monitor: Kaleidoscope. See W 2306.
1310 Voice of America: Focus. See M 1110.
1334 Christian Science Monitor: Letterbox. See M 0134.
1340 Voice of America: Science Report (Special English). See M 0040.
1345 Voice of America: The Making Of A Nation (Special English).

See H 0045.

- 1347 Christian Science Monitor: Religious Article. See M 0147.

Fridays

- 1306 Christian Science Monitor: Arts Forum or Sportsworld. See
H 2306.
- 1310 Voice of America: Focus. See M 1110.
- 1334 Christian Science Monitor: Letterbox. See M 0134.
- 1340 Voice of America: Science Report (Special English). See M
0040.
- 1345 Voice of America: American Mosaic (Special English). See
F 1115.
- 1347 Christian Science Monitor: Religious Article. See M 0147.

Saturdays

- 1305 Christian Science Monitor: Christian Science Sentinel. See
S 0005.
- 1310 Voice of America: On The Line. See S 0010.
- 1340 Voice of America: Words And Their Stories (Special English). See S 0040.
- 1345 Voice of America: American Stories (Special English). See
S 0045.

1400 UTC

[10:00 AM EDT/7:00 AM PDT]

FREQUENCIES

1400-1500	Australia, ABC Brisbane	4920do			
1400-1500	Australia, ABC Perth	6140do			
1400-1430	Australia, Radio	5995pa	7260pa	9580pa	11800pa
		11855pa	13755pa		
1400-1500	Australia, VLV6 Wanneroo	6140do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11955na	17820na		
1400-1500 mtwhfa	Canada, RCI Montreal	11935eu	15315eu	15325eu	17820eu
		17895eu	21455eu	21710eu	
1400-1500	China, China Radio Intl	11815na	11855as	15135as	
1400-1500	Costa Rica, R for Peace Int	7375na	7385am	13630na	15030am
		21465am			
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1400-1500	France, Radio France Intl	11910as	15405as	17650me	
1400-1500	Ghana, GBC Radio 1	4915do			
1400-1500	Ghana, GBC Radio 2	7295do			
1400-1500	India, All India Radio	9665as	11760as	15120as	
1400-1500 vl	Iraq, Radio Iraq Intl	15250as			
1400-1500 irreg	Italy, IRRS Milan	7125eu			
1400-1500	Japan, NHK Tokyo	9535am	11815as	11835am	
1400-1500	Jordan, Radio	9560eu			
1400-1500 mtwhf	Kenya, Voice of	4935do			
1400-1500	Lebanon, King of Hope	6280me			
1400-1500	Malaysia, RTM Radio 4	4950do	7295do		
1400-1500	Malta, V of Mediterranean	11925eu			
1400-1500	Netherlands, Radio	9890as	13770as	15150as	17610as
1400-1500	Nigeria, Voice of	7255af			
1400-1500	Palau, KHBN	9830pa			
1400-1500	Philippines, FEBC Manila	11995as			
1400-1500	Russia, Radio Moscow	7260as	9755as	11665me	11705as
		15125af	15140as	15225as	15290af
		15320af	15355as	15480as	17595af
		21785as			
1400-1500 vl	S Africa, Radio Oranje	9630do			
1400-1500	Singapore, SBC1	5010do	5052do	11940do	
1400-1500	South Korea, Radio Korea	9570as			
1400-1500	Sri Lanka, SLBC Colombo	6075as	9720as		

1400-1500	Taiwan, VOFC via WYFR	11550as			
1400-1430	United Kingdom, BBC London	6195as	7180as	9410eu	9515na
		9660eu	9740as	9750eu	9760eu
		11750as	11820as	11940af	12095eu
		15070va	15260af	15310as	15575me
		17640va	17705eu	17790af	17840am
		17880af	21490va	21660af	
1400-1500	USA, CS Monitor Boston MA	9530as	13625as	13760am	15665eu
1400-1500 sa	USA, CS Monitor Boston MA	13710na			
1400-1500	USA, KCBI Dallas TX	15375va			
1400-1500	USA, KTNB Salt Lk City UT	7510na			
1400-1500	USA, VOA Washington DC	6110as	7125as	9645as	9760as
		15160as	15255as	15395as	15425as
1400-1500	USA, WEWN Birmingham, AL	9350na			
1400-1500	USA, WHRI Noblesville IN	9465na	15105na		
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	USA, WYFR Okeechobee FL	6015am	11830am	17750na	
1400-1405	Vatican State, Vatican R	15090au	17525au		
1415-1500	Bhutan, BC Service	5025do			
1415-1425	Nepal, Radio	3230do	5005do	7165do	
1430-1500	Afghanistan, Radio	7200as			
1430-1500	Australia, Radio	7240pa	7260pa	9560pa	9580pa
		9770pa	11800pa	11855pa	13755pa
		21490pa			
1430-1500	Austria, R Austria Intl	6155eu	13730eu	15450eu	21490va
1430-1500	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am
1430-1435	India, All India Radio	7290do	9950do	10330do	
1430-1500 m	Indonesia, RRI Padang	4003pa			
1430-1500	Myanmar, VO Myanmar	5990do			
1430-1500 mtwhf	Portugal, Radio	21515me			
1430-1500	Romania, R Romania Intl	11775as	15335as	17720as	
1430-1500	United Kingdom, BBC London	6190af	6195as	7180as	9410eu
		9515na	9660eu	9740as	9750eu
		9760eu	11750as	11820as	11860me
		11940af	12095eu	15070eu	15260me
		15310as	15575me	17640va	17705eu
		17790af	17840am	17880af	21470va
		21660af			
1430-1500 irreg	USA, KJES Mesquite NM	11715na			
1435-1440	India, All India Radio	7290do	10330do		
1445-1500 smwha	Mongolia, R Ulaanbaatar	7260as	13780as		

SELECTED PROGRAMS

Sundays

- 1401 BBC: Feature. Societal conceptions of old age are the subject of "The Third Age" (6th, 13th, 20th).
 1405 Christian Science Monitor: Christian Science Sentinel. See S 0005.
 1410 Voice of America: The Concert Hall. Classical music and interviews with America's great artists and conductors.
 1430 BBC: Anything Goes. Bob Holness presents a variety of musical requests.
 1455 Voice of America: Editorial. American opinion.

Mondays

- 1405 BBC: Outlook. Conversation, controversy, and color from the UK and the world.
 1406 Christian Science Monitor: News Features And Interviews. See M 0006.
 1410 Voice of America: Asia Report. News, correspondent reports, interviews, and opinion.
 1430 BBC: Off The Shelf. See M 0430.
 1445 BBC: Musical Feature. See S 0445.
 1455 Voice of America: Editorial. See S 1455.

Tuesdays

- 1405 BBC: Outlook. See M 1405.
 1406 Christian Science Monitor: News Features And Interviews. See M 0006.
 1410 Voice of America: Asia Report. See M 1410.
 1430 BBC: Off The Shelf. See M 0430.
 1445 BBC: Musical Feature. See M 0145.
 1455 Voice of America: Editorial. See S 1455.

Wednesdays

- 1405 BBC: Outlook. See M 1405.
 1406 Christian Science Monitor: News Features And Interviews. See M 0006.
 1410 Voice of America: Asia Report. See M 1410.
 1430 BBC: Off The Shelf. See M 0430.
 1445 BBC: Good Books. A personal selection of good books to read.
 1455 Voice of America: Editorial. See S 1455.

Thursdays

- 1405 BBC: Outlook. See M 1405.
 1406 Christian Science Monitor: News Features And Interviews. See M 0006.

- 1410 Voice of America: Asia Report. See M 1410.
 1430 BBC: Off The Shelf. See M 0430.
 1445 BBC: Recording Of The Week. See M 0615.
 1455 Voice of America: Editorial. See S 1455.

Fridays

- 1405 BBC: Outlook. See M 1405.
 1406 Christian Science Monitor: News Features And Interviews. See M 0006.
 1410 Voice of America: Asia Report. See M 1410.
 1430 BBC: Off The Shelf. See M 0430.
 1445 BBC: Global Concerns. See F 0145.
 1455 Voice of America: Editorial. See S 1455.

Saturdays

- 1401 BBC: Sportsworld. Extensive coverage and results of all the weekend's sports.
 1405 Christian Science Monitor: Christian Science Sentinel. See S 0005.
 1410 Voice of America: Music, UA. (Jazz). Willis Conover looks at jazz of yesterday and today, in the UA. and abroad.
 1455 Voice of America: Editorial. See S 1455.

1500 UTC

[11:00 AM EDT/8:00 AM PDT]

FREQUENCIES

1500-1600	Australia, ABC Brisbane	6140do				1500-1555	Seychelles, FEBA Radio	9810as	11710as	15330as	
1500-1530	Australia, Radio	7240pa	7260pa	9560pa	9580pa	1500-1600	Singapore, SBC1	5010do	5052do	11940do	
		9770pa	11800pa	11855pa	13755pa	1500-1600	Sri Lanka, SLBC Colombo	6075as	9720as		
1500-1600	Canada, CFCX Montreal	6005do				1500-1530	Sudan, Radio Omdurman	7200do	9165do		
1500-1600	Canada, CFRX Toronto	6070do				1500-1530	Sweden, Radio	15240na	21500na		
1500-1600	Canada, CFVP Calgary	6030do				1500-1530	Switzerland, Swiss R Intl	15240af	15270af	21500af	21820me
1500-1600	Canada, CHNX Halifax	6130do				1500-1530	United Kingdom, BBC London	6190af	6195eu	7180as	9410eu
1500-1600	Canada, CKZU Vancouver	6160do						9515na	9740va	9760eu	11750as
1500-1559 s	Canada, RCI Montreal	11955na	17820na					11940af	12095eu	15070va	15260na
1500-1600	China, China Radio Intl	7405as	11815as	15135as				15310as	15400eu	17705eu	17840au
1500-1600	Costa Rica, R for Peace Int	7375am	7385am	13630am	15030am			17860af	17880af	21470af	21660af
		21465am				1500-1600	USA, CS Monitor Boston MA	9530as	13625as	13760am	15665eu
1500-1527	Czech Republic, R Prague	6055eu	7345eu	13600me	15535af	1500-1600 sa	USA, CS Monitor Boston MA	13760na			
		15605af	17535eu			1500-1600	USA, KCBI Dallas TX	15375va			
1500-1600	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am	1500-1600	USA, KTNB Salt Lk City UT	15590na			
1500-1550	Germany, Deutsche Welle	17185af	9735af	11965af	13610af	1500-1600	USA, VOA Washington DC	6110as	7125as	9645as	9700eu
		17735af	21600as					9760as	15205me	15255me	15395as
1500-1600	Guam, KTWB Agana	15610as				1500-1600	USA, WEWN Birmingham AL	18930me			
1500-1600 vl	Iraq, Radio Iraq Intl	15250as				1500-1600	USA, WHRI Noblesville IN	9465sa	15105na		
1500-1600	Japan, NHK Tokyo	11815as	15355af			1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600	Jordan, Radio	9560do				1500-1600	USA, WRNO New Orleans LA	15420na			
1500-1600	Malaysia, RTM Radio 4	4950do	7295do			1500-1600	USA, WYFR Okeechobee FL	6015na	11705na	11830na	17750na
1500-1600	Malta, V of Mediterranean	11925eu				1520-1540 mtwhfa	Greece, Voice of	15630na	15645na	17525na	
1500-1515 smwha	Mongolia, R Ulaanbaatar	7260as	13780as			1530-1600	Australia, Radio	6060pa	7240pa	7260pa	9560pa
1500-1600	Myanmar, VO Myanmar	5990do						9580pa	11800pa	11855pa	13755pa
1500-1600	Netherlands, Radio	9890as	13770as	15150as	17610as	1530-1600	Austria, R Austria Intl	11780as			
1500-1600	Nigeria, Radio	4990do	7285do			1530-1545	Finland, Radio	6120eu	11755eu	11820eu	15240me
1500-1600	Nigeria, Voice of	7255af						21550af			
1500-1600	North Korea, R Pyongyang	9325eu	9640af	9977af	13785eu	1530-1545	India, All India Radio	3945do	6140do	7290do	7412do
1500-1600	Palau, KHBN	9830pa						9950do	10330do		
1500-1600	Philippines, FEBC Manila	11995as				1530-1600	United Kingdom, BBC London	6190af	6195eu	7180as	9410eu
1500-1530	Romania, R Romania Intl	11775as	15335as	17720as				9515na	9740va	9760eu	11750as
1500-1600	Russia, Radio Moscow	9755na	9890na	9895as	11665me			11940af	12095eu	15070va	15260na
		15125na	15290me	15355as	15480na			15310as	15400eu	17705eu	17840am
		15550na	17580me	17765na				17860af	17880af	21470af	21660af
1500-1600 vl	S Africa, Radio Oranje	9630do				1545-1600	Vatican State, Vatican R	15090au	17865as		

SELECTED PROGRAMS

Sundays

- 1505 Christian Science Monitor: Christian Science Sentinel. See S 0005.
 1510 Voice of America: New Horizons. See S 1110.
 1515 BBC: Concert Hall. Classical music from the world's great concert halls.
 1530 Voice of America: Studio One. See S 1130.

Mondays

- 1506 Christian Science Monitor: Encore. See M 0106.
 1510 Voice of America: Newsline. See S 2310.
 1515 BBC: Feature. See M 0101.
 1530 Voice of America: Magazine Show. See M 1230.
 1534 Christian Science Monitor: Letterbox. See M 0134.
 1547 Christian Science Monitor: Religious Article. See M 0147.

Tuesdays

- 1506 Christian Science Monitor: Home Forum. See M 2306.
 1510 Voice of America: Newsline. See S 2310.
 1515 BBC: A Jolly Good Show. Dave Lee Travis presents listener rock music requests.
 1530 Voice of America: Magazine Show. See M 1230.
 1534 Christian Science Monitor: Letterbox. See M 0134.
 1547 Christian Science Monitor: Religious Article. See M 0147.

Wednesdays

- 1506 Christian Science Monitor: Curtain Call. See T 2306.

- 1510 Voice of America: Newsline. See S 2310.
 1515 BBC: Talks. See M 0415.
 1530 BBC: Comedy. A production from the BBC's crack comedy team (except 30th: Two Cheers For June, a humorous look at the month just past).
 1530 Voice of America: Magazine Show. See M 1230.

International Callsign Directory

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What *is* Special English?

Special English is a broadcast which uses a limited vocabulary and slower speech for the benefit of persons just learning the language.

- 1534 Christian Science Monitor: Letterbox. See M 0134.
 1547 Christian Science Monitor: Religious Article. See M 0147.

Thursdays

- 1506 Christian Science Monitor: Kaleidoscope. See W 2306.
 1510 Voice of America: Newsline. See S 2310.
 1515 BBC: Classics With Kay. See S 2315.
 1530 Voice of America: Magazine Show. See M 1230.
 1534 Christian Science Monitor: Letterbox. See M 0134.
 1547 Christian Science Monitor: Religious Article. See M 0147.

Fridays

- 1506 Christian Science Monitor: Arts Forum or Sportsworld. See H 2306.
 1510 Voice of America: Newsline. See S 2310.
 1515 BBC: Music Review. See H 2315.
 1530 Voice of America: Magazine Show. See M 1230.
 1534 Christian Science Monitor: Letterbox. See M 0134.
 1547 Christian Science Monitor: Religious Article. See M 0147.

Saturdays

- 1505 Christian Science Monitor: Christian Science Sentinel. See S 0005.
 1510 Voice of America: Close-Up. No details available.
 1515 BBC: Sportsworld. See A 1401.
 1530 Voice of America: Press Conference, UA. See S 0130.

1600 UTC

[12:00 PM EDT/9:00 AM PDT]

FREQUENCIES

1600-1700	Algiers, Radio	11715af	15160af			1600-1700	Sri Lanka, SLBC Colombo	6075as	9720as
1600-1630	Australia, Radio	6060pa	7240pa	7260pa	9560pa	1600-1700	Swaziland, TWR	9500af	
		9580pa	11800pa	11855pa	11880pa	1600-1645	UAE, UAE Radio Dubai	11795af	13675eu 15435eu 21605eu
		13755pa				1600-1630	United Kingdom, BBC London	3915as	6190af 6195eu 9410eu
1600-1700	Canada, CFCX Montreal	6005do						9515na	9740va 11750as 12095va
1600-1700	Canada, CFRX Toronto	6070do						15070va	15260na 15310as 15400eu
1600-1700	Canada, CFVP Calgary	6030do						17860af	17880af 21470af 21660af
1600-1700	Canada, CHNX Halifax	6130do				1600-1700	USA, CSMonitor Boston MA	11580as	13625va 17510na 21640af
1600-1700	Canada, CKZU Vancouver	6160do				1600-1700 sa	USA, CSMonitor Boston MA	13710na	17555am
1600-1700	China, China Radio Intl	11575af	15110af	15130af		1600-1700	USA, KCBI Dallas TX	15375va	
1600-1700	Costa Rica, R for Peace Int	7375na	7385am	13630na	15030na	1600-1700	USA, KTNB Salt Lk City UT	15590am	
		21465am				1600-1700	USA, VOA Washington DC	6110as	7125as 9700as 9760as
1600-1700	Ecuador, HCJB Quito	17790me	21455am	21480me				15395as	17895af 19379eu
1600-1700	France, Radio France Intl	11705af 1	2015af	15530me	17620af	1600-1700	USA, WEWN Birmingham AL	17535na	
		17795af	17850af			1600-1700	USA, WHRI Noblesville IN	9465na	13760na 15105na
1600-1630	Georgia, Georgian Radio	9656eu				1600-1700	USA, WJCR Upton KY	7490na	13595na
1600-1650	Germany, Deutsche Welle	6170as	7225as	9875as	11785as	1600-1700	USA, WRNO New Orleans LA	15420na	
		15105as	15595as	17810as	21680as	1600-1700	USA, WYFR Okeechobee FL	11705na	15355eu 17750eu 21525af
1600-1700	Ghana, GBC Radio 1	4915do						21615af	
1600-1700	Ghana, GBC Radio 2	7295do				1600-1630	Vatican State, Vatican R	6245eu	7250eu 15090as 17865as
1600-1700	Guam, KSDA Agana	11980as				1600-1630 a	Vatican State, Vatican R	15090af	17730af
1600-1645	Guam, KTWB Agana	15610as				1600-1630	Vietnam, Voice of	9840af	12020af 15010af
1600-1700 vl	Iraq, Radio Iraq Intl	15250as				1620-1700 vl	S Africa, Radio Oranje	3230do	
1600-1630	Italy, AWR Europe	15125eu				1630-1700	Australia, Radio	5995pa	6060pa 6080pa 7240pa
1600-1630	Netherlands, Radio	9890as	13700as	15150as	17610as			7260pa	9560pa 9580pa 11880pa
1600-1700	Nigeria, Radio	4990do						11910pa	13755pa
1600-1700	Nigeria, Voice of	7255af				1630-1657	Canada, RCI Montreal	7150as	9555as
1600-1630 s	Norway, Radio Norway Intl	15230eu	17720me	17825eu		1630-1700	Ecuador, HCJB Quito	17790me	21455me
1600-1630	Pakistan, Radio	11570me	13685af	15555af	17558af	1630-1700	Egypt, Radio Cairo	15255af	
		21495af				1630-1700 mtwhf	Portugal, Radio	21515me	
1600-1655	Poland, Polish R Warsaw	7285eu	9525eu	11840eu		1630-1700	United Kingdom, BBC London	3915as	5975as 6190af 6195eu
1600-1700	Russia, Radio Moscow	9660eu	9705eu	9715eu	9755eu			7160as	9410eu 9515na 9630af
		9860eu	11705na	15125as	15225as			9740va	11720as 11750as 12095va
		15290na	15355as	15540af	17700af			15070va	15260na 15310as 15400eu
1600-1700	S Africa, Channel Africa	5960af	17710af					15420af	17860af 17880af 21470af
1600-1700	Saudi Arabia, BSKSA	9705eu	9720eu					21660af	
1600-1605	Singapore, SBC1	5010do	5052do	11940do		1645-1700 s	Guam, KTWB Agana	15610as	
1600-1700	South Korea, Radio Korea	5975om	9870af			1650-1700 mtwhf	New Zealand, R NZ Intl	9675pa	

SELECTED PROGRAMS

Sundays

- 1605 Christian Science Monitor: The Sunday Service. A religious service from the First Church of Christ, Scientist, in Boston.
- 1610 Voice of America (af): Africa World Tonight. News and reports on world and African issues.
- 1610 Voice of America (eu): Encounter. See S 1210.
- 1615 BBC: Feature. See S 0230.
- 1640 Voice of America (eu): Words And Their Stories (Special English). See S 0040.
- 1645 BBC: Letter From America. See S 0615.
- 1645 Voice of America (eu): People In America (Special English). A feature program about America's diverse people.

Mondays

- 1606 Christian Science Monitor: News Features And Interviews. See M 0006.
- 1610 Voice of America (af): Africa World Tonight. See S 1610.
- 1610 Voice of America (eu): Focus. See M 1110.
- 1615 BBC: New Ideas. A look at the latest technology, innovations, and new products.
- 1635 BBC: Talks. This month, visit poetic settings in "Hallowed Ground."
- 1640 Voice of America (eu): Development Report (Special English). See T 1340.
- 1645 BBC: The World Today. A look at a topical aspect of the international scene.
- 1645 Voice of America (eu): This Is America (Special English). See M 1115.

Tuesdays

- 1606 Christian Science Monitor: News Features And Interviews. See M 0006.
- 1610 Voice of America (af): Africa World Tonight. See S 1610.
- 1610 Voice of America (eu): Focus. See M 1110.
- 1615 BBC: Megamix. See T 1130.
- 1640 Voice of America (eu) (Special English): Agriculture Report. See T 1110.
- 1645 BBC: The World Today. See M 1645.
- 1645 Voice of America (eu) (Special English): Science In The News. See T 1115.

Wednesdays

- 1606 Christian Science Monitor: News Features And Interviews. See M 0006.
- 1610 Voice of America (af): Africa World Tonight. See S 1610.
- 1610 Voice of America (eu): Focus. See M 1110.
- 1615 BBC: Rock/Pop Music. See T 0630.
- 1640 V. of America (eu): Science Report (Spec Eng). See M 0040.
- 1645 BBC: The World Today. See M 1645.
- 1645 V. of America (eu): Space And Man (Spec Eng). See W 1115.

Thursdays

- 1606 Christian Science Monitor: News Features And Interviews. See M 0006.
- 1610 Voice of America (af): Africa World Tonight. See S 1610.
- 1610 Voice of America (eu): Focus. See M 1110.
- 1615 BBC: Network UK. Issues and events affecting people across the UK.

- 1640 Voice of America (eu): Science Report (Special English). See M 0040.
- 1645 BBC: The World Today. See M 1645.
- 1645 Voice of America (eu): The Making Of A Nation (Special English). See H 0045.

Fridays

- 1606 Christian Science Monitor: News Features And Interviews. See M 0006.
- 1610 Voice of America (af): Africa World Tonight. See S 1610.
- 1610 Voice of America (eu): Focus. See M 1110.
- 1615 BBC: Science In Action. Latest in science and technology.
- 1640 Voice of America (eu): Environment Report (Special English). A feature program in s-l-o-w English.
- 1645 BBC: The World Today. See M 1645.
- 1645 Voice of America (eu): American Mosaic (Special English). See F 1115.

Saturdays

- 1605 Christian Science Monitor: Christian Science Sentinel. See S 0005.
- 1610 Voice of America (af): Africa World Tonight. See S 1610.
- 1610 Voice of America (eu): Communications World. See S 0110.
- 1615 BBC: Sportsworld. See A 1401.
- 1640 Voice of America (eu): In The News (Special English). A feature program in s-l-o-w English.
- 1645 V. of America (eu): American Stories (Spec Eng). See 0045.

1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1800	Algeria, Radio	9535me	17745af		
1700-1800	Australia, Radio	5995pa	6060pa	6080pa	7240pa
		7260pa	9560pa	9580pa	11880pa
		11910pa	13755pa		
1700-1800	Azerbaijan, Voice of	6175as			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	6955as	9570as	11575as	15345as
1700-1800	Costa Rica, R forPeace Int	7375na	7385am	13630na	15030na
		21465am			
1700-1727	Czech Republic, R Prague	6055eu	7345eu	9490eu	13600af
		15605af			
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	21480na
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800	Ghana, GBC Radio 1	4915do			
1700-1800 as	Guam, KSDA Agana	13720as			
1700-1715	Israel, Kol Israel	7465na	11587eu	11675eu	15640eu
1700-1800 irreg	Italy, IRRS Milan	7125eu			
1700-1800	Japan, NHK Tokyo	11815as	11865as	17775na	
1700-1800	Jordan, Radio	9560eu			
1700-1800 mtwhf	New Zealand, R NZ Intl	6035pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	11705eu
1700-1730 s	Norway, Radio Norway Intl	9655eu	15220eu		
1700-1800	Pakistan, Radio	9420eu	11570eu		
1700-1800	Russia, Radio Moscow	9540na	9685na	9840na	9860na
		11705af	11960af	12065af	15180as
		15290af	15355af	15385af	15395af
1700-1800	S Africa, Channel Africa	5960af	17710af		
1700-1800	Saudi Arabia, BSKSA	9705eu	9720eu		
1700-1730	Sri Lanka, SLBC Colombo	6075as	9720as		
1700-1730	Switzerland, Swiss R Intl	9885af	13635af	5430af	17635af
1700-1730	United Kingdom, BBC London	3915as	6180eu	6195eu	7325eu
		9410eu	9515na	9740va	12095va
		15070va	15400af	15420af	17880af
		21660af			
1700-1800	USA, CSMonitor Boston MA	11580as	13625va	17510na	21640af
1700-1800 sa	USA, CSMonitor Boston MA	13710na	17555am		
1700-1800	USA, KCBI Dallas TX	15375va			
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, VOA Washington DC	6110as	7125as	9645as	9700as
		9760me	11920af	15255me	15395as
		19379eu			
1700-1800	USA, WEWN Birmingham AL	13615na			
1700-1800	USA, WHRI Noblesville IN	13760am	15105am		
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WRNO New Orleans LA		15420na		
1700-1800	USA, WYFR Okeechobee FL	21500af			
1730-1800	Bulgaria, Radio	11720na	13670na		
1730-1800	Netherlands, Radio	6020af	7120af	21515af	21590af
1730-1800	Romania, R Romania Intl	15340af	15365af	17745af	17805af
1730-1800	Sweden, Radio	6065af	9645me	15270af	
1730-1800	United Kingdom, BBC London	6180eu	6195eu	7160me	7325eu
		9410eu	9740va	11720as	12095va
		15070va	15400af	15420af	17780af
		17880af	21660af		
1730-1800	Vatican State, Vatican R	11625af	15090af	17730af	
1745-1800	India, All India Radio	7412me	9950eu	11620eu	11860af
		15075eu			

1800 UTC [2:00 PM EDT/11:00 AM PDT]

1800-1900	Algeria, Radio	9535af	17745af		
1800-1900	Australia, Radio	6060pa	6080pa	7240pa	7260pa
		9580pa	11855pa	11880pa	11910pa
		5910af	13685eu	15540eu	
1800-1830	Belgium, R Vlaanderen				
1800-1900	Brazil, Radiobras	15265eu			
1800-1900	Bulgaria, Radio	11720na	13670na		
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica, R forPeace Int	7375am	7385am	13630am	15030am
		21465am			
1800-1900	Ecuador, HCJB Quito	17790eu	21455am	21480eu	
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900	Ghana, GBC Radio 1	4915do			
1800-1900	Ghana, GBC Radio 2	7295do			
1800-1900 as	Guam, KSDA Agana	13720as			
1800-1900	India, All India Radio	7412me	9950me	11620eu	11860af
		11935af	15080as		
1800-1900 irreg	Italy, IRRS Milan	7125eu			
1800-1900	Kuwait, Radio	13620na			
1800-1900	Netherlands, Radio	6020af	7120af	21515af	21590af
1800-1850 smtwhf	New Zealand, R NZ Intl	11735pa			
1800-1855	Poland, Polish R Warsaw	7270eu	9525eu		
1800-1900	Russia, Radio Moscow	9685as	9890eu	11630af	11770as
		12015af	15290af	15355me	15385af
		17875as	21670me		
1800-1900	Saudi Arabia, BSKSA	9705eu	9720eu		
1800-1900	South Korea, Radio Korea	15575eu			
1800-1900	Sudan, Radio Omdurman	7200do	9165do		
1800-1900	Swaziland, TWR	3200af	9500af		
1800-1830	United Kingdom, BBC London	3255af	6180eu	6195eu	7160va
		7325eu	9410va	9740va	11720as
		11955au	12095va	15070va	15400af
		15420af	17880af		
1800-1900	USA, CSMonitor Boston MA	9355eu	9430pa	13840na	15665eu
		21640af			
1800-1900 sa	USA, CSMonitor Boston MA	17555am			
1800-1900	USA, KCBI Dallas TX	15375va			
1800-1900 irreg	USA, KJES Mesquite NM	9510na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, VOA Washington DC	3980me	11920af	11995af	13710af
		15070af	15205me	15410af	15445af
		15580af	17800af	17895af	
1800-1900	USA, WEWN Birmingham AL	13615na	15695na		
1800-1900	USA, WHRI Noblesville IN	13760na	17830na		
1800-1900	USA, WINB Red Lion PA	15295eu			
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRNO New Orleans LA		15420na		
1800-1900	USA, WYFR Okeechobee FL	21500af			
1800-1830	Vietnam, Voice of	9840eu	12020eu	15010eu	
1815-1900	Bangladesh, Radio	9570me	12030eu		
1830-1900	Austria, R Austria Intl	5945eu	6155eu	9880me	13730me
1830-1900	Bulgaria, Radio	15330na			
1830-1855	Finland, Radio	6120eu	9730eu	11755eu	15440eu
1830-1900	Serbia, Radio Yuoslavia	6100eu	17710au		
1830-1900	Slovakia, Slovak Radio	5915eu	7345eu	9605eu	
1830-1900	Sri Lanka, SLBC Colombo	9720eu	15120eu		
1830-1900	United Kingdom, BBC London	3255af	6180eu	6195eu	7325eu



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Kenneth L. Bird, Evanston, IL

1900 UTC [3:00 PM EDT/12:00 PM PDT]

1900-2000	Algiers, Radio	9535eu	11715eu	17745eu
1900-2000	Argentina, RAE	15345eu		
1900-2000	Australia, Radio	6080pa	7240pa	7260pa 9580pa
		11720pa	11855pa	11880pa 11910pa
1900-2000	Canada, CFCX Montreal	6005do		
1900-2000	Canada, CFRX Toronto	6070do		
1900-2000	Canada, CFVP Calgary	6030do		
1900-2000	Canada, CHNX Halifax	6130do		
1900-2000	Canada, CKZU Vancouver	6160do		
1900-2000	China, China Radio Intl	6955af	9440af	
1900-2000	Costa Rica, R for Peace Int	7375na	7385am	13630na 15030na
		21465am		
1900-2000	Ecuador, HCJB Quito	17490va	17790eu	21455eu 21480eu
1900-1950	Germany, Deutsche Welle	9640af	11740af	11785af 11810af
		13790af	15350af	15390af 17765af
1900-2000	India, All India Radio	7412me	9950eu	11620eu 11860af
1900-1930	Israel, Kol Israel	7465eu	9435eu	11587na 11603na
		11675eu	15640na	15650af
1900-1930	Japan, NHK Tokyo	9640am		11865pa
1900-2000	Kuwait, Radio	13620na		
1900-1930 s	Lebanon, King of Hope	6280me		
1900-2000 s	Morocco, RTV Marocaine	11920as		
1900-1930	Netherlands, Radio	6020af	7120af	21515af 21590af
1900-2000 smtwhf	New Zealand, R NZ Intl	15120pa		
1900-2000	Nigeria, Radio	3326do	4990do	
1900-2000	Nigeria, Voice of	7255af		
1900-1930 s	Norway, Radio Norway Intl	15355pa	15365am	
1900-2000	Romania, R Romania Intl	9750eu	11810eu	11940eu 15365eu
1900-2000	Russia, AWR	9835eu		
1900-2000	Russia, Radio Galaxy	11880eu		
1900-2000	Russia, Radio Moscow	9685af	9725af	9785af 9860eu
		9890eu	11630eu	11770af 11840af
		11880eu	12015eu	15290eu 15355eu
		15425af	17605af	
1900-2000	Saudi Arabia, BSKSA	9705eu	9720eu	
1900-2000	Spain, Spanish Natl Radio	9675af	9685eu	
1900-2000	Sri Lanka, SLBC Colombo	9720eu	15120eu	
1900-2000	Swaziland, TWR	3200af	3240af	
1900-1930	United Kingdom, BBC London	3255af	6005af	6180eu 6190af
		6195va	7160me	9410va 9630af
		9740as	11955au	12095va 15070va
		15400af	17880af	
1900-2000	USA, CSMonitor Boston MA	9355eu	9430pa	13840na 1 5665eu
		21640af		
1900-2000 sa	USA, CSMonitor Boston MA	17555am		
1900-2000	USA, KCBI Dallas TX	15375va		
1900-2000	USA, KTBN Salt Lk City UT	15590am		
1900-2000	USA, VOA Washington DC	3980af	6040me	11995af 13710af
		15205me	15495af	15580af 17800af
		17895af	19379eu	
1900-2000	USA, WEWN Birmingham AL	13615na	15695na	
1900-2000	USA, WHRI Noblesville IN	13760na	17830na	
1900-2000	USA, WINB Red Lion PA	15295eu		
1900-2000	USA, WJCR Upton KY	7490na	13595na	
1900-2000	USA, WMLK Bethel PA	9465eu		
1900-2000	USA, WRNO New Orleans LA		15420na	
1900-2000	USA, WYFR Okeechobee FL	15355eu	21615af	
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu
1905-1915 mtwh/a	Greece, Voice of	7450eu	9375eu	11645eu
1910-1920	Botswana, Radio	3356af	4830af	7255af
1930-2000	Iran, VOIRI Tehran	9022va	15260va	
1930-2000	Netherlands, Radio	17605af	21590af	
1930-2000	Poland, Polish R Warsaw	7145eu	9525eu	
1930-2000	Saipan, KFBS	9465as		
1930-2000	United Kingdom, BBC London	3255af	6005af	6180eu 6190af
		6195va	7160me	9410va 9630af
		9740as	11955au	12095va 15070va
		15400af	17880af	
1935-1955	Italy, RAI Rome	7275eu	9710eu	11800eu
1940-2000 smwha	Mongolia, R Ulaanbaatar	11790eu	11850eu	
1945-2000	Bulgaria, Radio	11720eu	15330eu	
1950-2000	Vatican State, Vatican R	5885eu	7250eu	

2000 UTC [4:00 PM EDT/1:00 PM PDT]

2000-2030	Australia, Radio	6080pa	7240pa	7260pa 9580pa
		11720as	11855pa	11880pa 11910pa
2000-2100	Bulgaria, Radio	11720eu	15330eu	
2000-2100	Canada, CFCX Montreal	6005do		
2000-2100	Canada, CFRX Toronto	6070do		
2000-2100	Canada, CFVP Calgary	6030do		
2000-2100	Canada, CHNX Halifax	6130do		
2000-2100	Canada, CKZU Vancouver	6160do		
2000-2100	China, China Radio Intl	6950eu	9440af	9920eu 11500eu
		11715af		
2000-2100	Costa Rica, R for Peace Int	7375am	7385am	13630am 15030am
		21465am		
2000-2027	Czech Republic, R Prague	6055eu	7300eu	7345eu 9490eu
2000-2100	Ecuador, HCJB Quito	17790eu	21455am	21480eu
2000-2100	Ghana, GBC Radio 1	4915do		
2000-2100	Ghana, GBC Radio 2	7295do		
2000-2100	Indonesia, Voice of	9675eu	11752eu	
2000-2010 mtwhf	Kenya, Voice of	4935do		
2000-2100	Kuwait, Radio	13620na		
2000-2100	Lebanon, King of Hope	6280me		
2000-2010 smwha	Mongolia, R Ulaanbaatar	11850eu	12015eu	
2000-2030	Netherlands, Radio	17605af	21590af	
2000-2100	New Zealand, R NZ Intl	15120pa		
2000-2100	Nigeria, Radio	3326do	4990do	
2000-2030	Nigeria, Voice of	7255af		
2000-2100	North Korea, R Pyongyang	6576eu	9345eu	9640af 9977af
2000-2025	Poland, Polish R Warsaw	7145eu	9525eu	
2000-2030 mtwhf	Portugal, Radio	11740eu		
2000-2100	Russia, Radio Galaxy	11880eu		
2000-2100	Russia, Radio Moscow	7205eu	9610eu	9685eu 9725eu
		9785eu	9870eu	9890eu 11630af
		11760af	11770af	15290as 15355as
		15410af	15425me	15480af
2000-2100	Saudi Arabia, BSKSA	9705eu	9720eu	
2000-2045	Swaziland, TWR	3200af	3240af	
2000-2030	Switzerland, Swiss R Intl	9885af	12035af	13635af 15505af
2000-2030	Switzerland, Swiss R Intl	9885af	12035af	13635af 15505af
2000-2050	Turkey, Voice of	9445eu		
2000-2030	United Kingdom, BBC London	5975na	6180eu	6195va 7160as
		7325eu	9410va	9740as 11955au
		12095va	15070va	15260sa 15340au
		15400au	17880af	21660af
2000-2100	USA, CSMonitor Boston MA	9455as	13770eu	13840pa 15665eu
		17555sa		
2000-2100	USA, KCBI Dallas TX	15375va		
2000-2100	USA, KTBN Salt Lk City UT	15590am		
2000-2100	USA, VOA Washington DC	6040eu	9700eu	9760eu 11710eu
		13710af	15160eu	15205eu 15410af
		15445af	15495af	15580af 17650af
		17800af	17895af	19379eu 21485af
		21625af		
2000-2100	USA, WEWN Birmingham AL	13615na		
2000-2100	USA, WHRI Noblesville IN	13760af	17830na	
2000-2100	USA, WJCR Upton KY	7490na	13595na	
2000-2100	USA, WMLK Bethel PA	9465eu		
2000-2100	USA, WRNO New Orleans LA		15420na	
2000-2100	USA, WYFR Okeechobee FL	15566eu	17612af	21525eu 21615eu
2000-2030	Vatican State, Vatican R	9645af	11625af	15090af
2005-2100	Syria, Radio Damascus	12085na	15095na	
2010-2100 sa	Kenya, Voice of	4935do		
2025-2045	Italy, RAI Rome	7235me	9575me	11800me
2030-2100	Australia, Radio	5880pa	5995pa	6060pa 7240pa
		7260pa	9580pa	11720pa 11855pa
		7235eu	13650eu	13670af 15325eu
2030-2100	Canada, RCI Montreal	17820af	17850af	
		9830eu	13830eu	
2030-2035	Croatia, Croatian Radio	6145eu		
2030-2100	Egypt, Radio Cairo	15375af		
2030-2035	Latvia, Radio Riga	5935do		
2030-2057	Slovakia, Slovak Radio	7345eu		
2030-2100	South Korea, Radio Korea	6035af	7550me	15575eu
2030-2100	United Kingdom, BBC London	5975na	6005af	6180eu 6195va
		7325va	9410va	9630af 11955au
		12095va	15260au	15340au 15400af
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu

2100 UTC [5:00 PM EDT/2:00 PM PDT]

2100-2200	Algeria, Radio	11715af			
2100-2130	Australia, Radio	9540pa	9580pa	9645pa	11720pa
		11855as	11880pa		
2100-2125	Belgium, R Vlaanderen	5910eu	9905eu		
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2129	Canada, RCI Montreal	5995eu	7235eu	13650eu	13670af
		15325eu	17820af	17850af	17875eu
2100-2130	China, China Radio Intl	11715eu	15110eu		
2100-2200	China, China Radio Intl	9920eu	11715eu	15110eu	
2100-2200	Costa Rica, R forPeace Int	7375na	7385am	13630na	15030na
		21465na			
2100-2200	Cuba, Radio Havana Cuba	17760eu			
2100-2130	Czech Republic, R Prague	6055eu	7300eu	7345eu	9490eu
2100-2130	Ecuador, HCJB Quito	21455va			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2150	Germany, Deutsche Welle	9715af	9760as	9765as	11785as
		13690as	15135af	15350af	15360as
2100-2200	Ghana, GBC Radio 1	4915do			
2100-2200	Ghana, GBC Radio 2	7295do			
2100-2200	Hungary, Radio Budapest	6110eu	9835eu	11910eu	
2100-2200	Iraq, Radio Iraq Intl	11809eu			
2100-2200	Japan, NHK Tokyo	6035eu	7140eu	7210as	9640eu
		9750as	17890au		
2100-2130	Lebanon, King of Hope	6280me			
2100-2136 smtwhf	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, Radio	3326do	4990do		
2100-2130 s	Norway, Radio Norway Intl	15165na			
2100-2130 mtwhf	Portugal, Radio	15250af			
2100-2200	Romania, R Romania Intl	7195eu	7225eu	9750eu	11940eu
2100-2200	Russia, Radio Galaxy	11880eu			
2100-2200	Russia, Radio Moscow	7230eu	7300eu	9480af	9685me
		9725eu	9750eu	9820eu	11760af
		11905af	11960af	15290as	
2100-2130	Serbia, Radio Yugoslavia	6100eu	9505eu		
2100-2130	South Korea, Radio Korea	6480af	7550me	15575eu	
2100-2200	Spain, Spanish Natl Radio	6130eu			
2100-2200	Sri Lanka, SLBC Colombo	15120as			
2100-2200	Sweden, Radio	6065af	9655af		
2100-2105	Syria, Radio Damascus	12085na	15095na		
2100-2200	Ukraine, R Ukraine Intl	5960eu	7250eu	7340eu	9600eu
		9635eu	9865eu	15135na	15570eu
2100-2130	United Kingdom, BBC London	3225af	5975ca	6005af	6180eu
		6195va	7180pa	7325eu	9410eu
		9590na	11955pa	12095va	15070af
		15260sa	15340au	15370as	15400af
2100-2200	USA, CSMonitor Boston MA	9455as	13770eu	13840pa	15665eu
		17555sa			
2100-2200	USA, KCBi Dallas TX	15725am			
2100-2200	USA, KTBN Salt Lk City UT	15590na			
2100-2200	USA, VOA Washington DC	6040af	9700af	9760eu	11870as
		11960eu	15185as	15205eu	17735as
		17895af	19379eu	21485af	
2100-2200	USA, WEWN Birmingham AL	13615na			
2100-2200	USA, WHRI Noblesville IN	13760na	17830na		
2100-2200	USA, WINB Red Lion PA	15185eu			
2100-2200	USA, WJCR Upton KY	7490na	13595va		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRNO New Orleans LA		15420na		
2100-2200	USA, WYFR Okeechobee FL	17612eu	17750af	21615eu	
2103-2110	Vatican State, Vatican R	5885eu	7250eu		
2110-2200	Croatia, Croatian Radio	9830eu	13830eu		
2115-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130 mtwhf	United Kingdom, BBC Carib	15390ca	17715ca		
2130-2200	Australia, Radio	9540pa	9645pa	11720pa	11855pa
		11880pa	11910pa		
2130-2200	Austria, R Austria Intl	5945eu	6155eu	9880eu	13730af
2130-2200	Ecuador, HCJB Quito	17490va	17790eu	21455va	21480eu
2130-2200	Finland, Radio	6120eu	11755eu	15440eu	
2130-2200	Israel, Kol Israel	7465na	9435na	11587na	11603na
		11675eu	15640eu	15650na	17575sa
2130-2200 smtwhf	Lebanon, King of Hope	6280me			
2130-2200	Lithuania, Radio Vilnius	9675eu	9710eu		
2130-2200	Sweden, Radio	6065eu	9655pa	11955as	
2130-2200	United Kingdom, BBC Fik Is	13660sa			

2130-2200	United Kingdom, BBC London	3225af	5975ca	6005af	6180eu
		6195va	7180pa	7325eu	9410eu
		9590na	11955pa	12095va	15070af
		15260sa	15340au	15370as	15400af
2139-2200	New Zealand, R NZ Intl	15120pa			
2145-2200	Bulgaria, Radio	11720na	15330na		

2200 UTC [6:00 PM EDT/3:00 PM PDT]

2200-2230	Albania, R Tirana Intl	9760eu	11825eu		
2200-2230	Australia, Radio	9540as	9645pa	11720pa	11855as
		11880pa	15320pa	15365as	17795pa
			11720na		
2200-2215	Bulgaria, Radio	9700na			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, RCI Montreal	5960na	7195eu	9755na	11705as
		11730ca	13670ca	15305ca	
2200-2230	China, China Radio Intl	3985eu	9740eu		
2200-2300	Costa Rica, R forPeace Int	7375ca	13630ca	15030ca	
2200-2300	Cuba, Radio Havana Cuba	6180va			
2200-2230	Czech Republic, R Prague	5960eu	6055eu	7345eu	9605eu
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2245	Finland, Radio	9730eu	11740eu	11810eu	
2200-2300	Ghana, GBC Radio 1	4915do			
2200-2300	Ghana, GBC Radio 2	7295do			
2200-2230	India, All India Radio	7412eu	9910eu	9950eu	11620eu
		11715eu	15265eu		
2200-2257 irreg	Iraq, Radio Iraq Intl	11809eu			
2200-2225	Italy, RAI Rome	5990as	9710as	11800as	
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300	New Zealand, R NZ Intl	15120pa			
2200-2300	Nigeria, Radio	3326do	4990do		
2200-2300	Russia, Radio Galaxy	9880eu			
2200-2300	Russia, Radio Moscow	4860eu	7150eu	7300eu	9480af
		9685eu	9715eu	9725eu	9815eu
		9820eu	11905af	17560af	17570af
2200-2300	Singapore, SBC1	5010do	5052do	11940do	
2200-2230	Switzerland, Swiss R Intl	5995am	9810am	9885am	12035am
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	17750eu	21615eu	21670eu	
2200-2300	Turkey, Voice of	9445na			
2200-2300	UAE, Radio Abu Dhabi	9770na	11885na		
2200-2300	Ukraine, R Ukraine Intl	4795eu	6020eu	7195eu	7240eu
		9710eu	9860eu		
2200-2300	United Kingdom, BBC London	5970eu	5975na	6195va	7325eu
		9410af	9570pa	9590na	9750as
		9915va	11750sa	11955pa	12095af
		15070va	15260sa	15340au 1	5400af
2200-2300	USA, CSMonitor Boston MA	9465na	13625as	13770eu	15405as
		17555sa			
2200-2300	USA, KCBi Dallas TX	15725va			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, VOA Washington DC	6030sa	7120as	9770as	11760as
		15185as	15290as	15305as	17735as
		17820as			
2200-2300	USA, WHRI Noblesville IN	17830na			
2200-2245	USA, WINB Red Lion PA	15185eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRNO New Orleans LA		15420na		
2200-2300	USA, WYFR Okeechobee FL		17612na	21525eu	
2200-2230 s	USA, KGEI San Francisco CA		15280sa		
2203-2209	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
2230-2300	Australia, Radio	9645pa	11720pa	11855pa	11880pa
		15320pa	15365pa	17795pa	
		5960am	5995am	7195am	9755am
		13670am			
2230-2300	Sweden, Radio	6065pa	11910pa		
2230-2300	USA, VOA Washington DC	9770as	11760as	11905me	17885me
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	Armenia, Radio Yerevan	7440eu	11920na	11970eu	
2245-2300	India, All India Radio	9910as	11745as	15110as	15145as
		17830as			
2245-2300	USA, WINB Red Lion PA	15145eu			
2245-2300	Vatican State, Vatican R	9600as	11830as	15090pa	

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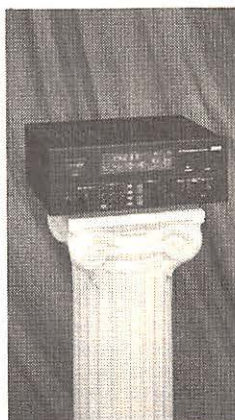
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2300 UTC

[7:00 PM EDT/4:00 PM PDT]

FREQUENCIES

2300-2400	Australia, Radio	11770pa	11880pa	15240pa	15320pa	2300-2400	UAE, Radio Abu Dhabi	9605na	11710na	11815na	
		15365pa	17795pa	21740pa		2300-2330	United Kingdom, BBC London	5970eu	5975na	6175na	6195as
2300-2315	Bulgaria, Radio	11720na	15330na					7180as	7325eu	9570as	9590na
2300-2400	Canada, CFCX Montreal	6005do						9915sa	11750sa	11945as	11955va
2300-2400	Canada, CFRX Toronto	6070do						12095na	15070am	15260sa	15280as
2300-2400	Canada, CFVP Calgary	6030do						15400as			
2300-2400	Canada, CHNX Halifax	6130do				2300-2400	USA, CSMonitor Boston MA	9465na	13625as	13770eu	15405as
2300-2400	Canada, CKZU Vancouver	6160do						17555am			
2300-2400	Canada, RCI Montreal	5960na	7195na	9755na	13670na	2300-2400	USA, KCBI Dallas TX	15725va			
2300-2400	Costa Rica, AWR Alajuela	9725ca	11870ca			2300-2400	USA, KTVN Salt Lk City UT	15590na			
2300-2400	Costa Rica, R for Peace Int	7375na	7385na	13630na	15030na	2300-2400	USA, KVOH Los Angeles CA	9725am			
		21465na				2300-2400	USA, VOA Washington DC	7140va	7215as	9530me	9770as
2300-2400	Ecuador, HCJB Quito	17790eu	21455am					11760as	11905me	11960eu	15185as
2300-2305	Ghana, GBC Radio 1	4915do						15290as	15305as	17735as	17820as
2300-2305	Ghana, GBC Radio 2	7295do						17885me			
2300-2400	Guam, KSDA Agana	15610as				2300-2400	USA, WHRI Noblesville IN	9495am	13760am		
2300-2400	India, All India Radio	9910as	11715as	11745as	15110as	2300-2400	USA, WINB Red Lion PA	15145eu			
		15145as	17830as			2300-2400	USA, WJCR Upton KY	7490na	13595na		
2300-2355	Japan, NHK Tokyo	6150eu	7140eu	11815as	15430as	2300-2400	USA, WRNO New Orleans LA	7355na			
2300-2330	Lithuania, Radio Vilnius	11750na				2300-2315	Vatican State, Vatican R	9600as	11830as	15090pa	
2300-2400 smtwha	Malaysia, RTM Radio 4	7295do				2300-0000	Belgium, R Vlaanderen	9930na	13655na		
2300-2400	New Zealand, R NZ Intl	15120pa				2300-2400 a	Colombia, Radio Nacional	11822.5	17865am		
2300-2350	North Korea, R Pyongyang	11700am	13650am			2300-2400	Netherlands, Radio	6020na	6165na		
2300-2330 s	Norway, Radio Norway Intl	9655am	11795am			2300-2400	Palau, KHBN	9830va			
2300-2400	Russia, Radio Moscow	7300na	9480na	9815eu	11905na	2300-2400 m	Sri Lanka, SLBC Colombo	15425am			
		15425na	15535as	17560as	17570as	2300-2400	Sweden, Radio	6065eu	11910eu		
		21625as	21670as	21690as		2300-2400	United Kingdom, BBC London	5975na	6175na	6195as	7325eu
2300-2310	Sierra Leone, SLBS	3316do						9570as	9590na	9915sa	11750sa
2300-2400	Singapore, SBC1	5010do	5052do	11940do				11945as	11955va	12095na	15070am
2300-2330	Sweden, Radio	6065pa	11910pa					15260sa	15280as		
2300-2400	Thailand, Radio	9655as	11905as			2300-2400	Vietnam, Voice of	9840as	12020as	15010as	
2300-2350	Turkey, Voice of	7185me	11895eu			2335-2345 smtwhf	Greece, Voice of	9425am	11645am		

SELECTED PROGRAMS

Sundays

- 2305 BBC: World Business Review. The previous week's news and upcoming events.
- 2310 Voice of America: Newline. News, correspondent reports, interviews, and opinion.
- 2315 BBC: Classics With Kay. Brian Kay with his choice of classical music.
- 2330 Voice of America: VOA Morning. See S 0010.

Mondays

- 2305 BBC: World Business Report. The latest news from the markets worldwide.
- 2306 Christian Science Monitor: Home Forum. News and information for the family.
- 2310 Voice of America: Newline. See S 2310.
- 2315 BBC: Talks. Hear news from the world of education in "The Learning World" (through July 12th).
- 2330 BBC: Multitrack 1. Tim Smith presents the smash singles on the UK pop-music charts.
- 2330 Voice of America: VOA Morning. See S 0010.
- 2334 Christian Science Monitor: Letterbox. See M 0134.
- 2347 Christian Science Monitor: Religious Article. See M 0147.

Tuesdays

- 2305 BBC: World Business Report. See M 2305.
- 2306 Christian Science Monitor: Curtain Call. Music and profiles of musicians.
- 2310 Voice of America: Newline. See S 2310.
- 2315 BBC: Concert Hall. See S 1515.
- 2330 Voice of America: VOA Morning. See S 0010.

- 2334 Christian Science Monitor: Letterbox. See M 0134.
- 2347 Christian Science Monitor: Religious Article. See M 0147.

Wednesdays

- 2305 BBC: World Business Report. See M 2305.
- 2306 Christian Science Monitor: Kaleidoscope. In-depth news features.
- 2310 Voice of America: Newline. See S 2310.
- 2315 BBC: From Our Own Correspondent. See S 0330.
- 2330 BBC: Multitrack 2. Graham Bannerman presents new pop records, interviews, news, and competitions.
- 2330 Voice of America: VOA Morning. See S 0010.
- 2334 Christian Science Monitor: Letterbox. See M 0134.
- 2347 Christian Science Monitor: Religious Article. See M 0147.

Thursdays

- 2305 BBC: World Business Report. See M 2305.
- 2306 Christian Science Monitor: Arts Forum or Sportsworld. News from the world of arts or sports.
- 2310 Voice of America: Newline. See S 2310.
- 2315 BBC: Music Review. News and features from the world of classical music.
- 2330 Voice of America: VOA Morning. See S 0010.
- 2334 Christian Science Monitor: Letterbox. See M 0134.
- 2347 Christian Science Monitor: Religious Article. See M 0147.

Fridays

- 2305 BBC: World Business Report. See M 2305.
- 2306 Christian Science Monitor: Encore. See M 0106.
- 2310 Voice of America: VOA Morning. See S 0010.
- 2315 BBC: Worldbrief. A roundup of the week's news headlines and developments.
- 2330 BBC: Multitrack 3. Sarah Ward presents the latest from the alternative pop scene.
- 2334 Christian Science Monitor: Letterbox. See M 0134.
- 2347 Christian Science Monitor: Religious Article. See M 0147.

Saturdays

- 2305 BBC: Words Of Faith. See M 1209.
- 2305 Christian Science Monitor: Christian Science Sentinel. See S 0005.
- 2310 BBC: Book Choice. See W 0425.
- 2310 Voice of America: VOA Morning. See S 0010.
- 2315 BBC: A Jolly Good Show. See T 1515.

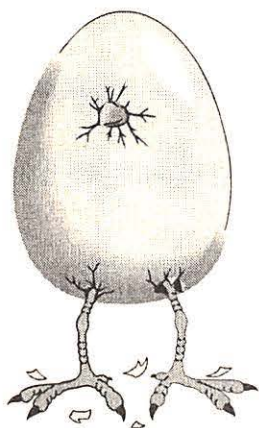
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Isn't it time that YOU broke out of your shell?

The Grove SDU-100 SPECTRUM DISPLAY UNIT

For your ICOM R7000 and R7100

Something a little different...



The all-new **Grove SDU-100** allows you to do something that has never been **SEEN** before at this price; it allows you to **LOOK** at the radio spectrum and to **SEE** signals as they are transmitted. The **SDU-100** plugs directly into the IF output on the back of your receiver and, as you tune, it follows your dial, showing you up to a 10MHz span of spectrum. Don't miss those brief transmissions. Overcome the hit-and-miss tactic of scanners. **SEE** everything at once!

Along with this intercept power, you can also analyze your signal with a real-time oscilloscope! And if necessary, freeze it, right there on your screen!

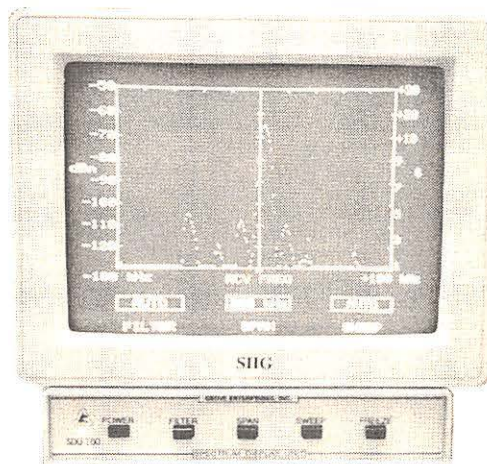
Powered by the supplied AC adaptor, the SDU-100 can be configured to work with almost any receiver that has an IF output such as 8.8, 10.7, 21.4, 45 and 70 MHz. It outputs to a standard TTL monochrome monitor like the Grove VID-100, and can operate on 12 VDC for mobile or field environments!

So if you are ready to break out of the standard listening environment, get ready to fly! The SDU-100 is the next generation of the listening hobby!

**GIVE US
A CALL!**



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(800) 438-8155 (orders only)
(704) 837-7081 (technical help)
(704) 837-9200 (outside US)
140 Dog Branch Road
Brasstown, NC 28902



Specifications:

SPAN: 10, 5, 2, 1, MHz; 500, 200, 100, 0 (Time) kHz
DISPLAY ACCURACY: +/-3% or +/-3 dB, whichever is larger
RESOLUTION BANDWIDTH: 5, 30 kHz
SWEEP TIME: 0.1, 0.5, 2, 6 seconds
IF: 10.7 (others available by special order)
VIDEO OUTPUT: TTL to optional monochrome monitor
MINIMUM DETECTABLE SIGNAL (MDS): -130 dBm nom.
DISPLAY DYNAMIC RANGE: 80 dB

ORDER TODAY!

*Special pricing when you order the
SDU-100 Spectrum Display Unit and
VID-100 9" CRT monitor together:*

\$599⁹⁵!

Plus \$12 UPS;
\$23.50 2nd Day Air;
\$25.50 US Priority Mail;
\$16 Canadian UPS;
\$30.50 Canadian APP



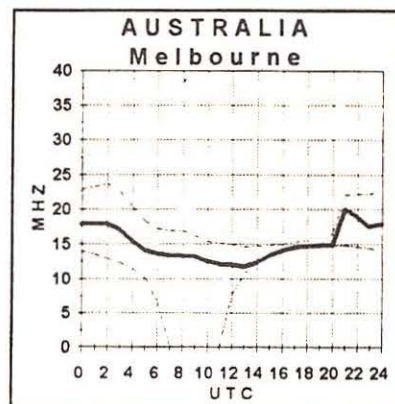
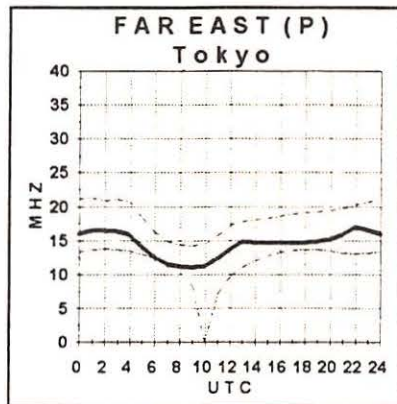
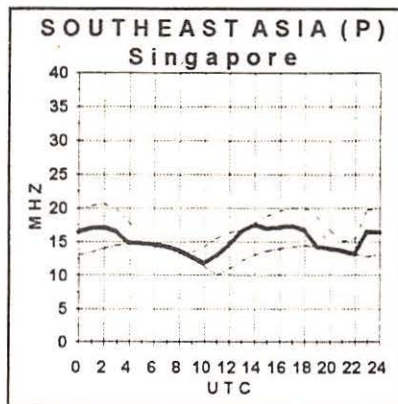
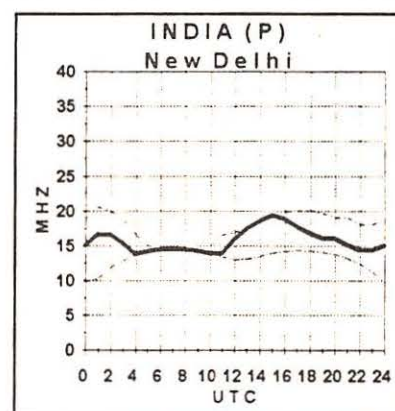
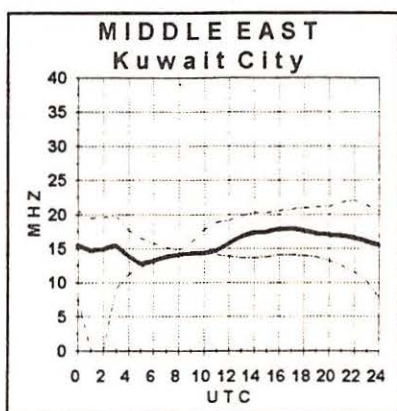
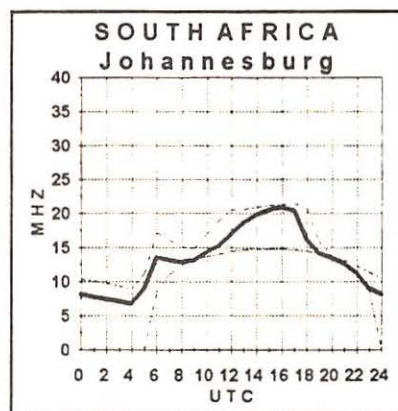
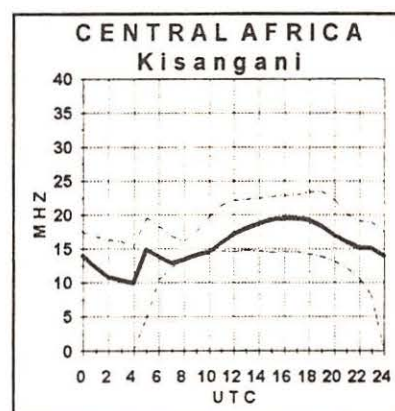
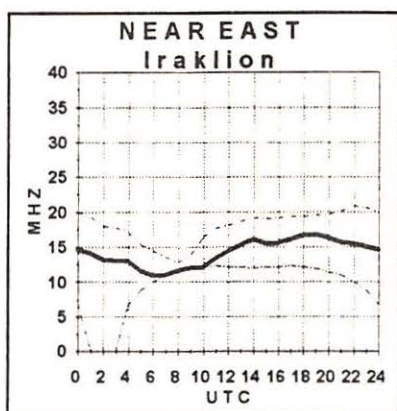
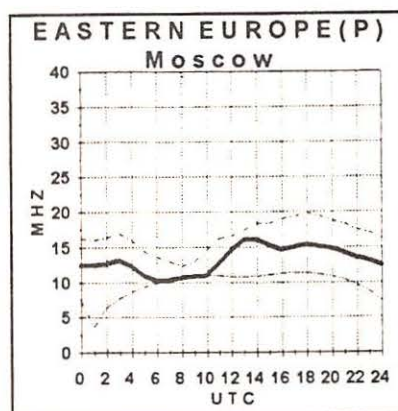
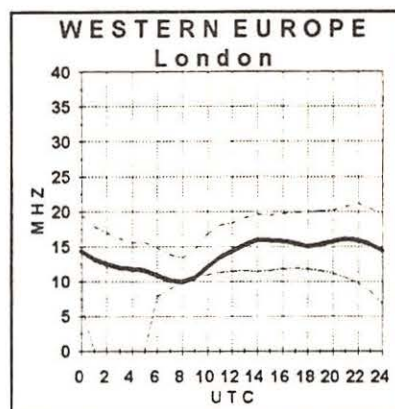
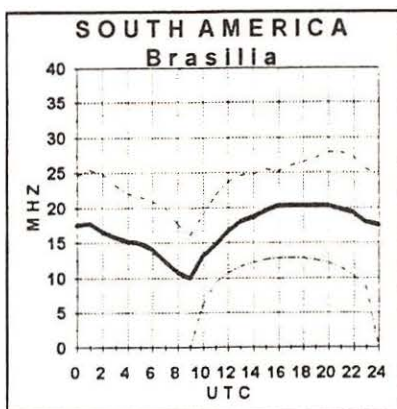
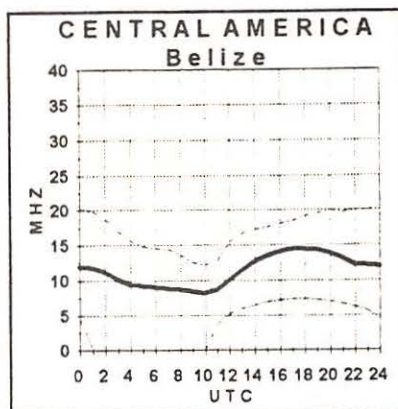
Ordered separately:

SDU-100 Spectrum Display Unit: \$499.95
Plus \$7.50 UPS; \$10.50 2nd Day Air; \$11.50 US Priority Mail;
\$10.50 Canadian UPS; \$14 Canadian APP

VID-100 9" CRT Monitor: \$149.95
Plus \$8 UPS; \$16.50 2nd Day Air; \$17 US Priority Mail;
\$13 Canadian UPS; \$21 Canadian APP

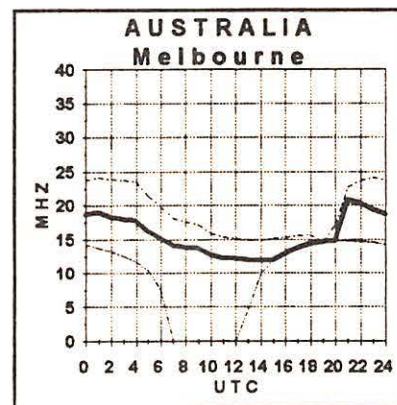
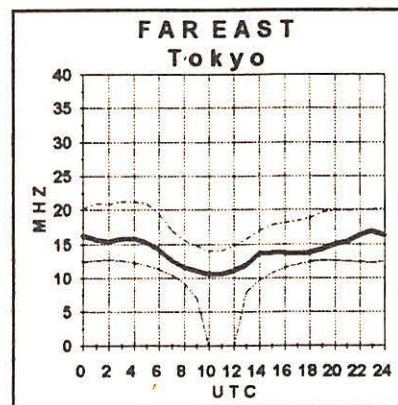
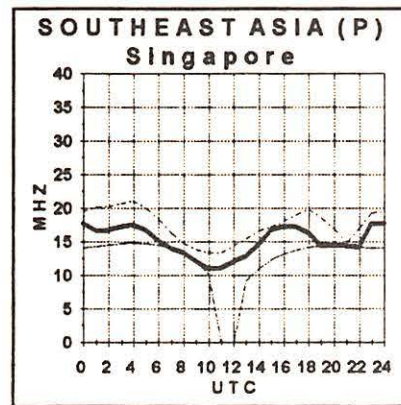
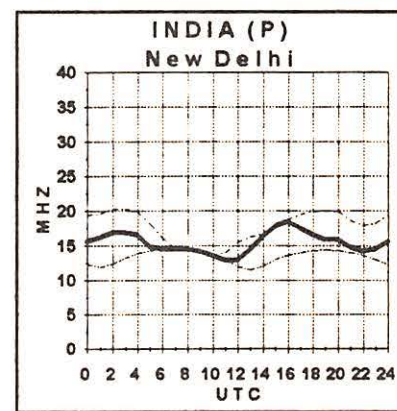
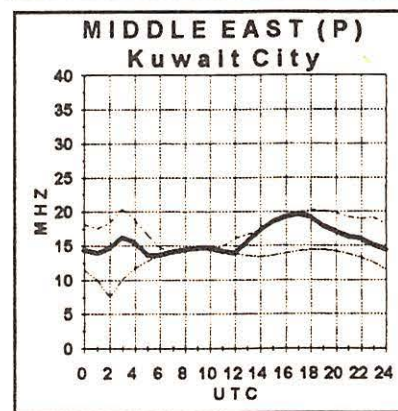
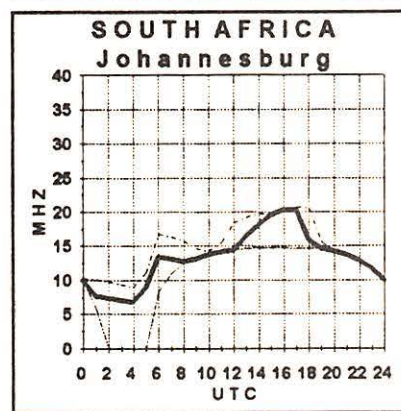
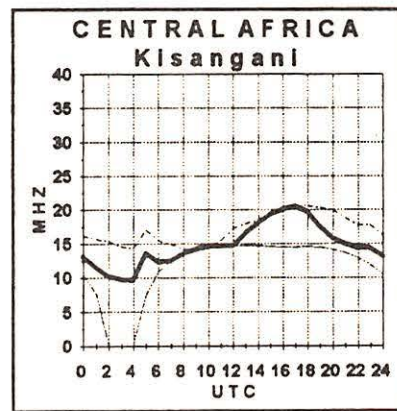
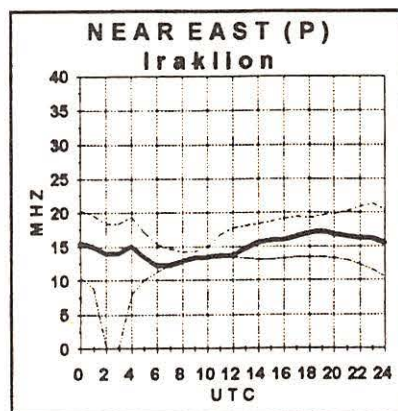
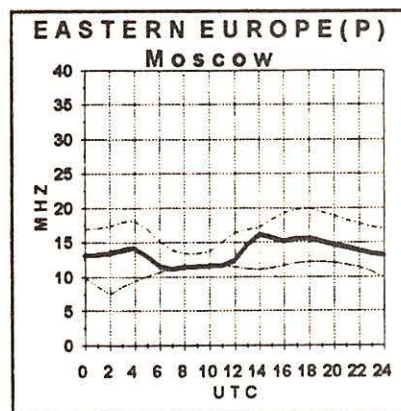
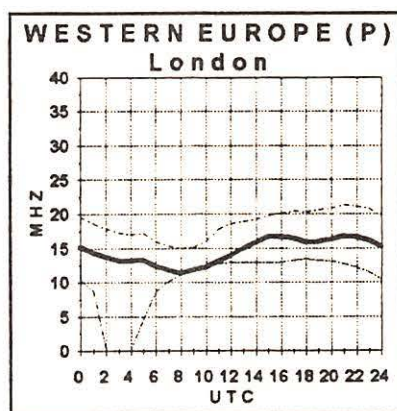
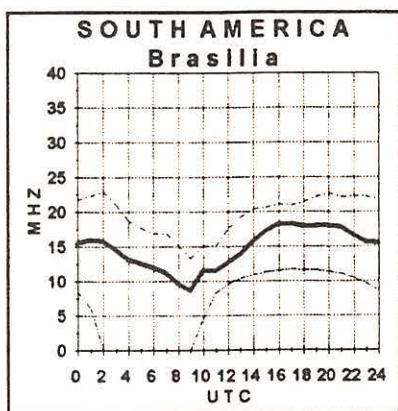
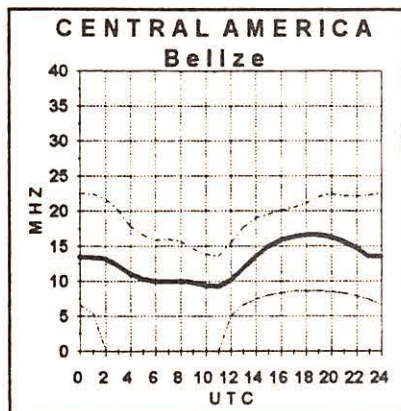
Propagation conditions: Eastern United States

How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.



Propagation Conditions: Western United States

Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.



what's new?

Larry Miller

**Made in the
USA**

At least one person has a "Made in the USA" American Electrola DX-100 AM/FM/shortwave radio. According to talk show host Chuck Harder, the first unit was sent to President Bill Clinton.

According to Harder, listeners began complaining about a lack of U.S. made radios. He was unsuccessful in finding a source, so he began building them himself.

The campaign began when Harder asked his listeners to pay in advance, trust them and "we would order our parts and gear up to make the radios." Harder claims to have received \$250,000 in advance orders.

Right now, Harder says that the American Electrola plant in Pittsburgh, Pennsylvania, employs 12 workers; however, there is no word on a formal production schedule. Keep an eye on Larry Magne's column for information on this very interesting story.

GMRS
Fun

One of the hottest and fastest growing services in the two-way radio field is GMRS or General Mobile Radio Service. GMRS radios must be licensed (no test is required), and are available for limited-range, non-business communications such as family outings, hiking, camping and so forth.

Radio Shack has just introduced its new PRS-100 Two-Channel Handheld GMRS



transceiver. The PRS-100 is a lightweight unit manufactured to commercial-grade standards, which reflects its intended outdoor use. Reception range is in the vicinity of several miles, depending on terrain.

The PRS-100 comes with a rechargeable 8-hour battery, charger, detachable antenna, a belt clip and 462.7125 and 462.6375 MHz crystals. A license application (Form 574) is included with every radio.

The application fee, which covers all members of the licensee's immediate family residing in the same household, is \$35.00. The radio, however, is a tad more expensive, ringing in at \$249.95 from your local Radio Shack store.

Shortwave Radio Guide

It's got to be one of the hardest tasks on earth — writing a book that introduces the novice to the radio hobby. The problem is that there's so much to tell. And then there's all the technical jargon — an inescapable web that seems to entice most hobby writers.

More than one potential radio hobbyist has decided to start collecting toy trains after getting hit over the head by the formula for discovering the length of a quarter wave dipole on 5965 kHz.

Author Anita Louise McCormick has written a really nice "intro" book about the radio hobby, one of the best we've seen in years. It's basic, easy-to-read, and reflects that author's obvious enthusiasm for the hobby without overwhelming. Most commendable is the fact that McCormick corrals the technical information (such as it is) into its own chapter at the very end of the book.

Shortwave Radio Listening for Beginners starts with a brief



history of radio and then goes on to look at the various facets of the radio hobby, including AM DXing and scanning. Shortwave radio is covered in slightly more depth and includes information on where to tune, how to tune and what to expect. There are also short station profiles on the major broadcasters and tips on QSLing and the like.

Shortwave Radio Listening for Beginners receives a "thumbs up" for the radio beginner in your midst. It's published by Tab-McGraw and is available from Grove Enterprises for \$10.95 plus \$4 shipping.

History of International Broadcasting

If *Shortwave Radio Listening for Beginners* is designed to get your feet wet, then James Wood's *History of International Broadcasting* is a plunge in a pool.

This 250+ page hardback rides a fine line between the technical and the non-technical. While there is plenty of non-technical historic information, it is unique in that it concentrates on transmission as opposed to programming.

Wood examines the birth of the medium, its early commercial days and then its rapid growth as an instrument of war. The pictures alone are worth the price of the book. There's a shot of Britain's G5SW transmitter at Daventry in 1927 that's excellent. For the most part, Wood concentrates on the Voice of America, BBC, Deutsche Welle, Radio France International, Radio Monte Carlo, the Christian Science Monitor and Trans World Radio.

If you're serious about your shortwave — and who isn't? — this book is a must. The price may scare a few folks away, though. You'll shell out \$59.00 to IEEE, Doty Rodriguez, PPL Dept./IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, New Jersey 08855-1331. For more information, call 908-562-5551.

**OFFICIAL
NEW HAMPSHIRE
SCANNER GUIDE**

Police, Fire, Emergency & Much More
Robert A. Coburn, W1JJO EDITOR
Steven C. Donnell, John Mahoney, and Scott Rice

- [illegible]



Selected Frequencies:
Vermont
Maine
Massachusetts

PUBLIC SAFETY
PL - CODES INCLUDED!

Alphabetical Listing by Community
Cross Reference Listing by Frequency and Call

New Hampshire Guide

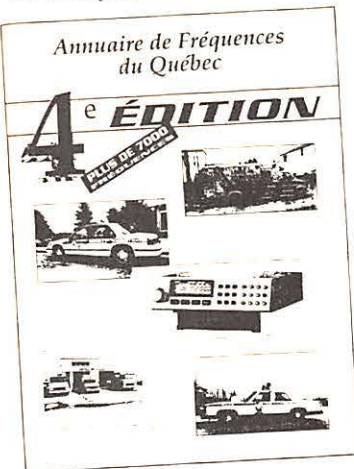
Scanner listeners are not left out of this month's rare, bumper crop of books and accessories, especially those fortunate enough to live in New Hampshire. The new 6th edition of the *Official New Hampshire Scanner Guide* is now available.

This 320 page guide contains 10,185 listings by community and also includes a cross reference listing by frequency to aid in the identification of the users of a particular frequency.

The first section examines specific statewide and regional systems with coverage maps, channel plans and radio codes. Also included is detailed coverage of the new state police high band repeater system, public service of New Hampshire system, Emergency Medical Radio Service, and Appalachian Mountain Club. Notification systems have been updated as well.

The price of this excellent book is \$17.95 plus \$3.05

shipping and handling. Copies may be ordered from your favorite book dealer or from Official Scanner Guide, P.O. Box 712, Londonderry, New Hampshire 03053. They're the best. Tell 'em MT sent you.



Quebec Directory

Last year we highly recommended the *Annuaire de Fréquences du Québec* — despite the fact that the book is in French and we don't speak the language. This year, in keeping with tradition, we'll also recommend the new 4th edition.

Again, the book is in French. And we still don't speak the language. But here's what author Gilles Thibodeau says about his book: "Édité spécialement pour les scanners, cette édition améliorée couvre toute la province de Québec de 30 à 960MHz.

"Vous y trouverez les services suivants: Ambulance, Courrier, Département des travaux publics, Incendies, Police, Sécurité du Québec et plusieurs autres..."

Information — over 7,000 frequencies — is arranged by frequency and includes the use and user. A second section lists frequencies by location. In addition there are 10-codes, maps and even some scanner mods, in French.

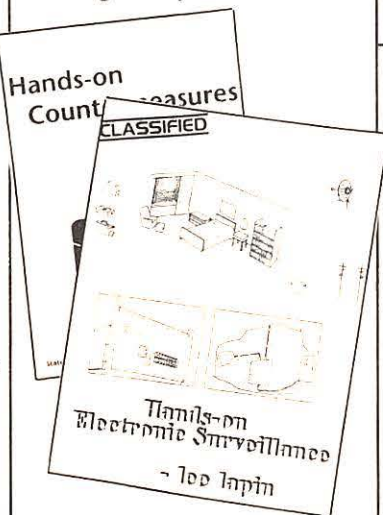
Annuaire de Fréquences du Québec is available for (CAN) \$17.95 from Gilles Thibodeau, C.P. 193, Lac-Mégantic, QB, Canada G6B 2S6. *Bonjour.*

Common Man Spook Stuff

Intelligence Incorporated has released two new books on electronic surveillance. The books are not, as the publisher says, "Ohhh, look at that" books, but rather a "professional consultation" with well-known author Lee Lapin.

Says I.I. manager Dan Stevens, "These books are the first-ever agency-level publications that actually explain, and then demonstrate, the real tricks, techniques, and sources that have been painstakingly developed by a few of the best wire men in the world."

It's worth mentioning that despite their level of sophistication, both are written in layman's language for ease of use. *Hands-On Electronic Surveillance* concentrates on the designs and placement of audio surveillance systems, transmitters, receivers and integrated systems and more.



Hands-On Countermeasures shows how to protect yourself from electronic surveillance including threat assessment and covert equipment discovery. The books are \$22.95 each plus \$5.00 shipping per order.

The address is Intelligence Incorporated, 2228 El Camino Real, San Mateo, California 94403. A toll-free number is available: 1-800-247-6553. Tell them MT sent you.

DELTACOMM™ DSS

Digital Signal Strength

Option For Your ICOM™ R7000

DELTACOMM™ I-7000 and your MS-DOS computer integrated with the Delta Research custom CI-V interface and optimized software will not just control but will maximize the potential of your ICOM™ IC-R7000's monitoring capability.

- CYBERSCAN function allows scan file tracking control of systems employing frequency hopping techniques.
- Spectrum log at speeds in excess of 1300 channels a minute, generate a real time histogram of activity and create scan database file automatically.
- Birdie log during frequency search automatically characterizes your R7000, then locks out those frequencies.
- Activity log function continuously monitors and logs all frequencies of a scan database while displaying active, was active and never active channels.



Optional DELTACOMM™ DSS (Digital Signal Strength) upgrade for your DELTACOMM™ I-7000 communication manager.

- Innovative interface design allows digitizing and storing the R7000 signal level information with 8-bit accuracy via your computer's game/joy stick port.
- DSS allows user programmable upper and/or lower signal level detection limits during DELTACOMM™ I-7000's spectrum log, scan and search functions.
- Log signal strength information to printer or delimited log file while DELTACOMM™ I-7000 is scanning or activity logging the selected database file.

DELTACOMM™ I-7000 communication manager program includes all cabling, manual, UL listed power supply and Delta Research custom CI-V interface for \$299.00 + \$8.00 (U.S.) or \$25.00 (foreign) S&H. The DELTACOMM™ DSS interface upgrade comes complete with easy to follow NO SOLDER installation instructions, all cabling and 8-bit DSS A/D converter module (game port required) for \$99.00 + \$8.00 (U.S.) or \$25.00 (foreign) S&H and is available as an upgrade option to registered I-7000 users. Contact us for additional information on DELTACOMM™ communication managers for ICOM™ R7100, R71A, R72 and IC735.



Delta Research



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Protection for Your Shack

It was only a few days after the *Washington Post* revealed the existence of an internal Energy Department report saying that disasters were "likely" at U.S. Atomic Arms Plants, that we received a package from James Tunnell. Tunnell, you might recall, is the author of the best-selling book, *Latest Intelligence*.

Now Tunnell is selling nuclear device detectors. According to Tunnell, these are the same sensitive handheld units used by Nuclear Emergency Search Teams (NEST) and EOD/law enforcement personnel to examine suspect containers, aircraft, ships or confined spaces for bombs planted by terrorists.

Manufactured by Simpson Electronics, the units are new, fully calibrated, and operate on "D" batteries. Each unit comes with an operating manual and a

current list of tactical frequencies assigned to the Department of Energy/NEST.

The units — these are not toys — retailed originally for \$300 and are not usually available to the public. Tunnell has a limited quantity of these detectors for \$50.00 including shipping. Make your check payable to James Tunnell, 5525-MT Olinda Road, El Sobrante, California 94803.

Radio Catalogs

If you're a broadcast junkie, you'll love East Anglican Productions' 1992-93 "Jingle Catalog." Not only are there selections of actual radio sound effects and jingles, but CDs of interest as well — like "Don't Touch that dial," a recording of Johnny Walker on Radio Carolina from back in 1968.

There are also pirate radio jingles from the 1960s, 70s and 80s, plus documentaries like "The Veronica Story," "Laser 558," "Ten Years of Offshore Radio" and much more.

If you're into the Euro-pirate scene or just want a piece of radio history for yourself, get a copy of the catalog. Send your catalog request to East Anglica Productions, Studio House, 21-23 Walton Road, Frinton-on-Sea, Essex CO13 0AA, England.



The International Campus/Community Radio Catalog is a collection of audio information products from stations throughout Canada. Available are tapes of documentaries on such things as the lives of Native women in the home, school and in the community; "The Billionaire Club," a presentation of Norwegian non-commercial music groups; "Celebration of Entropy," an abstract soundwork of anti-music; "Amsterdam," a 60 minute tape of music, poetry and radio art that "considers time, space and relativity."

Says the catalog, "After the LSD delivery, one finds gravity doesn't rhyme with monotony." Right.

It's interesting. It's weird. Get your copy of this free catalog from CFLR Radio, Laurentian University, 8935 Ramsey Lake Rd., Sudbury, Ontario P3E 2C6 Canada. Address your request to Frank Cinque.

Impedance Matching

BMI, which manufactures the popular Nitellogger Automatic Recorder Activator, has introduced its RC1A Impedance Matching Patch Cord. In short, it's designed to simplify the recording of the audio outputs of scanners, shortwave radios, repeaters, portable radios, or any audio device designed to drive a speaker.

The RC1A provides the proper impedance match between a nominal 8 Ohm source and a standard 600 Ohm recorder input. The unit provides approximately 20 dB of attenuation to prevent recorder input overload and features both capacitive isolation of the audio signal and proper loading for the source device.

Input and output connectors are standard 3.5mm mini plugs and are compatible with most radios and recorders. The price of the RC1A is \$19.95 from BMI, 9445 Seven Mile Road, Dept. MT, Caledonia, Wisconsin 53108 or call 1-414-835-4299.

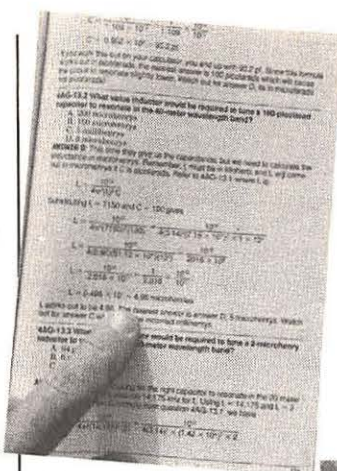
Morse Lives

Oddly, since the new ham radio no-code license was established, there's been something of a resurgence of interest in Samuel Morse's system of dots and dashes.

The Code Book, a new title by author Robert Halprin, K1XA, is a compelling work that advances the cause of Morse code. Halprin gives a look at Morse Code, an introduction to amateur CW and goes on to point out its advantages.

There are also chapters on how to pass the 5 and 13 words-per-minute code tests, CW subbands, operating techniques, key tips on improving speed and more.

The Code Book: Amateur Radio CW Operations is available for \$17.95 plus 2.00 shipping from Tiare Publications, P.O. Box 493-MT, Lake Geneva, Wisconsin 53147.



Going Up to Advanced

Amateur radio operators who want to upgrade to Advanced Class licenses can now get a boost from Gordon West.

West's 173-page FCC license preparation book covers all 507 examination questions, the four possible answers and Gordo's unique explanation for every single question.

Gordon West's Advanced Class License Preparation book, is available from several sources, including Radio Shack, or you can order from the W5YI Group at 1-800-669-9594. The price of the book is \$9.95. Tell them that MT sent you.

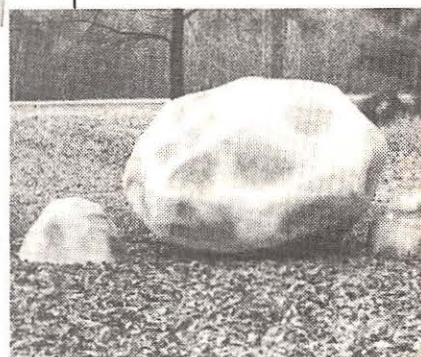


Multi-Mode Controller

Advanced Electronic Applications (AEA) has just introduced its latest multi-mode data controller, the PK-900. The PK-900, boasting a powerful triple processor system, provides the following features: all standard digital modes, dual simultaneous ports, PACTOR option, large back-lit LCD display, 9600 bps

G3RUH/K9NG plug-in option, six selectable receive modem tone pairs from 170 to 1000 Hz, packet and AMTOR maildrop, 16 gray shade WEFAX (with optional software) and more.

The PK-900 retails for \$549. To get more information, call AEA at 1-800-432-8873.



Disguised Antennas

Perhaps a year ago, a firm began offering shortwave and scanner antennas that looked like roof vents. The product was, if I recall correctly, called the "ventenna." It was a great idea.

Now comes a firm called "Perfect 10" with a solution to nosey neighbors who don't like the idea of your having a satellite antenna out on the lawn.

The "Rock It" is a high performance antenna system that includes a high performance six foot dish, 25 degree LNB, a Chaparral PR1EA and an Ajak motorized horizon to horizon mount — all encased in a custom painted grey or brown rock enclosure. What a great idea.

We hereby give the 1993 "What's New" award for commendable sneakiness to "Rock It." We'd suggest that they design some rocks with scanner and shortwave antennas inside but the sight of a boulder on the roof would be a dead give-away.

For more information, call Don and Terry at 501-982-2354.

Reviews

By Bob Grove

MFJ Mobile Scanner Antenna

The new MFJ-1824 magnetic mount mobile scanner antenna is a black, low profile (20") wire antenna with a center decoupling coil. The 1824 comes with 12 feet of coax terminate with a PL-259 connector and either a BNC adaptor (1824BB) or Motorola adaptor (1824MM). We tested it against the popular Grove ANT-4 for comparison.

The MFJ showed distinctly higher signal levels at UHF, equal performance at high band, and lower signals at low band. See Table 1 for an actual comparison.



Table 1	
MHz	Gain Over ANT-4
27	-10 dB
42	-10 dB
46	-7 dB
155	0 dB
300	+3 dB
460	+3 dB
870	+12 dB

If CB, cordless phone and highway patrol monitoring are of paramount importance, the Grove works best. If UHF and 800 MHz targets are the goal, select the MFJ. High band performance is identical.

MFJ-1824 is \$19.95 plus shipping from MFJ Enterprises, PO Box 494, Mississippi State, MS 39762.

Cellu-Shield

With the latest cellular cancer scare, a number of opportunists have come to the fore to cash in on our neuroses. At this writing at least two companies offer devices purported to reduce the radiation emitted toward the head from a hand-held cellular telephone.

Do they really work? We decided to test one of the units in our lab. Cellu-Shield (\$29.95 from PO Box 4357, Boynton Beach, FL 33424; ph. 407-738-5288) is a vinyl-encapsulated, six-inch metallic laminate, intended to be attached to the cell phone whip.

The directions advise placing it on the side of the whip facing the operator's head to absorb radiation in that direction without substantially altering radiation from the other direction.

What's in the device? Apparently a sandwich of solder-coated brass strip around a rubber magnet. This is interesting in theory since brass is diamagnetic (repels magnetism) while magnetic iron is paramagnetic (attracts magnetism).

Professional laboratories use carbon-based materials, not metals, as radio wave absorbers; this is the principle behind stealth bombers and anti-traffic-radar materials.

To be completely fair, we attached the Cellu-Shield to a cellular whip and tested it in the laboratory with a signal generator, spectrum analyzer and vector analyzer.

The Cellu-Shield detuned the whip from resonance, giving it about a 4:1 VSWR. With the unit perfectly positioned using our test

instruments rather than the instructions, we saw approximately 2-3 dB difference, a reduction of 40-50% in signal strength — but in all directions.

Some additional experimentation yielded a precise location where there may have been 1-2 dB difference front to back on the whip, but such a position would not be possible to duplicate in the consumer environment, and this amount of attenuation would have debatable value.

Since it would be difficult for the non-technical cell-phone user to know that the unit was set exactly right, and there is no information correlating signal level intensity with brain cancer, a valid determination as to the effectiveness of such a device is not possible.

We suspect that a 3 dB in-line attenuator connected between the phone and the antenna would do the same thing — reduce the radiation and the range by lowering the power.

A coaxial extension lifting the antenna a few inches higher (above the head) would be even better since it wouldn't reduce radiation, but would remove the main pattern lobe from the head.

Cellu-Shield does not come with any guarantee against brain cancer, nor does it include any disclaimer. Does the contrivance really work? Will the manufacturer still be around if it doesn't? It's too early to tell.

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AOR AR33B

For many years — even before handheld programmable scanners became prominent — AOR of Japan manufactured a synthesized, compact VHF receiver. It didn't have scanning, but it did have a thumbwheel which could select any allocatable channel in the 140-170 MHz range.

Now updated, the AR33B includes two programmable memory channels and its thumbwheel steps in 10 kHz increments; an offset switch allows third-digit (5 kHz) frequency entries.

Although the thumbwheel allows frequency settings outside the specified range, any setting outside 140.000-169.995 MHz results in a beep alarm.

Concentric control knobs adjust squelch and volume. The squelch is tight without annoying hysteresis; the audio is crisp even when loud (100 milliwatts maximum). A 3/32" jack accommodates the earphone (included).

The radio operates for 20-40 hours (depending upon audio output) from two AA alkaline cells; there is no provision for recharging NiCds. The case is sturdy black plastic with compact dimensions of only 2-1/2 inches wide by 5 inches high and 1 inch deep. It weighs less than half a pound.

The flex whip is very slim, affixed with a miniature SMA connector at the base. An SMA-BNC adaptor is included as a convenience for substituting other antennas.

The circuit is a dual conversion superheterodyne with a 23 dB SINAD sensitivity of 0.22 microvolts and a squelch sensitivity of 0.15 microvolts. It is a hot performer with no birdies (spurious signals) anywhere in its tuning range.

A varactor-tuned RF stage tracks the tuned settings for optimum reception. Adjacent channel selectivity (12.5 kHz spacing) is 35 dB and at 25 kHz separation it is at least 70 dB. This radio uses good filters!

We applaud the manufacturer for including a complete schematic diagram, parts locator diagram and block diagram in the simple instruction manual.

While many readers may be puzzled as to why anyone would pay nearly \$250 for a one-band receiver with no scanning, the answer is in performance. If you need a reliable VHF high band radio, this is it.

AR-33B, \$249.95 plus shipping from Communications Specialists, Inc., 426 West Taft Avenue, Orange, CA 92665-4296 or call 800-854-0547. Dealer inquiries invited.

MT



Scanner Sensitivity

Scanner owners are understandably bewildered by specifications for their radios. Not only do manufacturers not use the same system of measurement, but their own figures are misleading. Typically, these figures are averages, and differences between scanners of the same model are encountered in production.

To further complicate things, whip antennas on handheld radios are not all equal, so that a poorly designed antenna can result in poorer reception on the scanner with the best sensitivity.

One manufacturer intentionally reduces the sensitivity of its scanners, realizing that every 1 dB reduction in sensitivity results in a 3 dB reduction in intermodulation, the most common interference complaint among scanner users in strong signal areas.

Recently we decided to take four scanners to the lab and test them for relative sensitivity. Rather than use the often abused SINAD (signal plus noise to noise ratio), we elected to test for MDS — minimum detectable signal. This is the level that just breaks a tightly-set squelch, revealing a weak signal.

The scanners we compared were the old but sensitive AR-2002 desktop, the venerable Uniden BC200XLT handheld, the presently popular Realistic PRO-43 handheld and the new Realistic PRO-46 handheld.

The following chart shows the test frequencies in megahertz and squelch-break MDS in microvolts for the four listed models. The lower the number, the better the sensitivity.

FREQ	PRO46	PRO43	AR2002	BC200
42.50	0.22	0.25	0.13	0.19
155.55	0.21	0.20	0.11	0.23
411.55	0.80	0.70	0.12	0.25
461.55	0.60	1.20	0.11	0.23
822.50	0.13	0.70	0.32	0.28

Conclusions

The old AR2002, as expected, showed the best sensitivity. Of the handhelds, the Bearcat 200 was consistently better than the two Realistics.

In actual listening tests, the three handhelds were so close that it was difficult or impossible to tell the difference on even the weakest of signals. All flex whips performed virtually identically.

1994 PASSPORT TO WORLD BAND RADIO

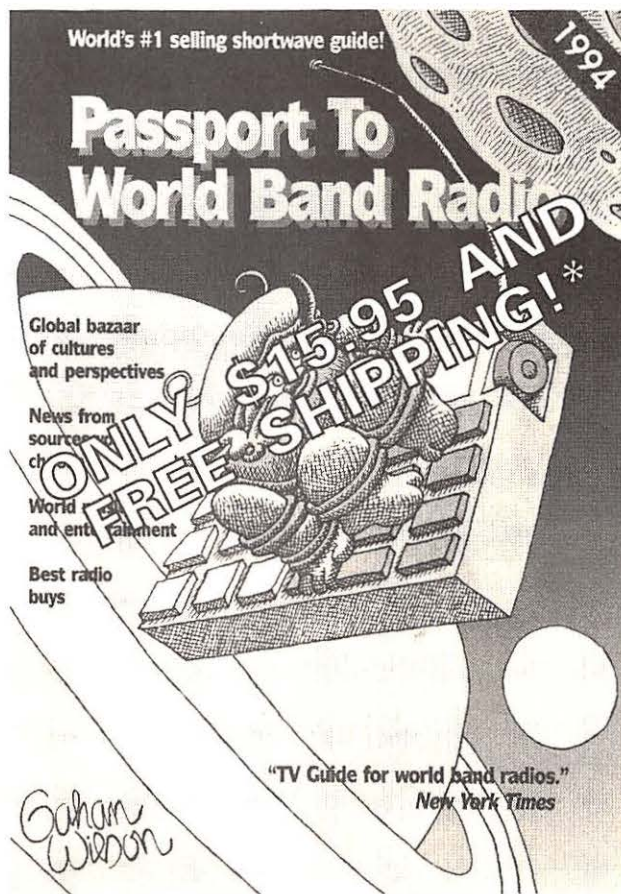
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• Sony ICF-SW33

• Revised "World Access Radio" Forthcoming

For some time, now, Sony has been applying its engineering creativity to try to make world band reception less mysterious. Some attempts have been more fortunate than others, but thus far there has been no single grand solution.

The reason, of course, is to help world band catch on as a broader-based consumer item. Why not? International broadcasting is a one-of-a-kind remedy for TV's news operas, with their same goshagolly visuals and similar coverage of the same dozen stories. But Sony has been faced with yet another obstacle: the Sumo Yen. Whatever Sony does, and no matter how exactly its plans are executed, "Made in Japan" means being highly priced in the international market. The Chinese and others, sniffing blood, have chewed away at Japanese manufacturers' market shares by coming in at far lower prices.

Simplified Radio

Both these issues touch on Sony's latest compact portable offering, the ICF-SW33, with a street price of around \$170. By the standards of Sony digital portables, it's a straightforward radio: no keypad, no tuning knob, no single-sideband demodulation. While none of this simplifies the shortwave medium as such, they at least make operation of the radio relatively uncomplicated. And they also help keep the price down.

In this spirit, the '33 comes bare-bones, with nary an accessory except a tape-measure-type external antenna and a cloth carrying pouch. No AC power supply, even though the radio costs around 25-30 cents an hour to operate off batteries; and no earpieces, even though sound quality is enhanced by a good set of earphones.

Tuning is bare bones, too. There's a single-speed up/down slewing control, only seven shortwave presets (plus ten for other bands), "signal-seek" scanning and a meter-band carousel. The normal version of the radio tunes the regular and Japanese FM bands; mediumwave AM; and shortwave from:

3700-4200	4650-5150
5800-6300	6950-7450
9375-10000	11525-12150
13375-14000	14975-15600
17475-18100	21320-21950
25475-26100	kHz

That's pretty complete coverage, but some listeners will miss the 7455-7550, 9350-9375 and 15600-15700 kHz ranges that are increas-

ingly used by some American and other major broadcasters.

Nice Array of Small Touches

From here, things go uphill. Little touches, such as an unusual two-time-zone clock and a self-extinguishing light for the LCD, help the '33 stand out from the competition. The battery-life indicator is similarly sophisticated, even if its habit of suddenly shutting down the radio when batteries are low can be disconcerting. You have three minutes to change batteries without erasing the memory, a major improvement over the otherwise-excellent and more costly Sony ICF-2010.

There's also a travel power lock, and FM is in stereo when you listen with headphones. For bedtime use, there's a sleep-off control, plus the radio can be set to turn on at any one given time to function as an alarm, or simply to switch on a favorite program. Also for travel, there's a carrying strap, not found on Sangean and some other competing models, plus there's a key lock to prevent switching out the station by accident if you're listening on the move. The telescopic antenna rotates and swivels, and there's a flip-out elevation panel so the radio can be operated at a comfortable angle.

Innovative Clock Configuration

The '33's clock is particularly interesting, even though it doesn't show seconds numerically or appear independent of the displayed frequency.

To clear away much of the fog surrounding World Time (UTC)—at *Passport to World Band Radio* we've found this to be one of the most confusing things to newcomers—the clock automatically sets World Time relative to the listener's local time. It even includes a manual Daylight Savings Time adjustment for the local-time display. Although the operating guide's instructions are not the best, the end result is nigh foolproof. Still, it's not equal to that ultimate in simplicity: World Time preset at the factory.

Here's how the clock works. A major city in the chosen time zone is displayed, at least for certain parts of the world. Thus, if you're along the American East Coast, the LCD shows not only the local time, but also "NEW YORK." Nice idea, except that the radio also displays "LONDON" in large letters alongside "World" in small letters. That's fine in the winter, when World Time and London Time are one and the same. But in the summer London is one hour ahead of World Time, so the displayed location of "London" is wrong for roughly half the year. A simple "UTC" would have been more appropriate.

Another small bugaboo is that the little 12/24 hour selector button, secreted above the battery compartment, is awfully delicate. In North America, the '33's clock comes factory preset to the 12-hour standard. If you're trying to change over from that to 24 hours and it doesn't work—the selectors had minds of their own on both our units—forget it and try again later on, when it may be more cooperative. If you persist and press down hard on this tiny selector, as we did on one of ours—*kaput!*



Clunky Tuning, Superior Performance

How does the '33 perform?

As with the Drake R8, there's a clear demarcation between handiness of tuning and quality of reception. With so little flexibility in the way of operating controls, tuning the radio from Point A to Point B can be downright frustrating. Ditto bandscanning with the slewing controls, which chug and otherwise cover up all but snippets of what there is underneath to hear. The lack of a keypad, the inability to select more than a single (1 kHz) slew rate, the paucity of presets: these all conspire to make tuning pretty marginal.

But there's nothing marginal about performance. Unlike many competing simpler portables with digital readout, the '33 has double conversion to zap image interference, exquisite selectivity to keep adjacent-channel interference at bay, and good sensitivity to weak signals. Its through-the-speaker audio, while lacking anything in the way of "fi", is unusually intelligible. Fading is hardly noticeable, and virtually banished are those horrendous 5 kHz piggylike squeals that normally curse the shortwave bands.

The '33 clearly does not emit the rich, enhanced-fidelity sound of a Drake R8, which is a pleasure to listen to hour after hour. But it is simple, affordable and free from the characteristic aural annoyances of shortwave.

Bottom Line

Overall, this is a darned good little radio for listening over moderate periods to a finite number of favorite stations.

Here's what it is not: bandscanning anything but powerful signals, which are grabbed pretty well by the scanner. Because of this, the '33 is hardly the portable of choice for searching out signals of modest strength.

Here's what it is: a nice act for those who want something uncomplicated to operate, and which can bring in shortwave broadcasts free from just about as many squeaks and squawks as possible.

The \$64 question is, how many consumers will choose such offerings from Sony and other legitimate firms when similar-looking junkers from China are being hyped in the marketplace for far less? After all, DAK sells tens of thousands of its \$69.90 "Global Interceptor" radios by advertising that people can "hear Haitian military leaders' reaction to U.S. plans" by simply pressing 4-9-3-0, or "hear Somali plans to establish law and order" by pressing 7-1-9-9. "In English," its ad copy boasts farther on.

Small problems: neither of these is on the air, plus when 4VEH in Haiti was active it confined its programming to inspirational material, not

news. And when that Somali channel was active, to understand it you'd have had to know either *Somali* or *Arabic*!

No wonder Sony and others are suffering the effects of a "radio Gresham's Law," with the bad driving out the good. While it would be encouraging to see the Federal Trade Commission looking into the present situation, it would also be helpful if Sony could find ways, such as production in countries other than Japan, to bring the price down.

World Access Radio Being Reworked

Further to things that don't work as you might hope, the long-awaited "World Access Radio 8A," made in Pennsylvania, finally came on the market earlier this year. We tried one, and it was a profound disappointment.

Apparently the manufacturer concurs, as they made only 100 units before going back to the drawing board. An improved version reportedly is due out shortly, and when it appears we'll roll up our sleeves and sniff it out from top to bottom.

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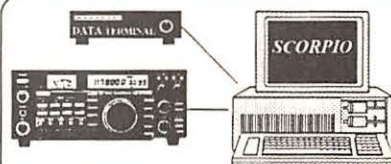
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More Fax to be Considered

Over the past few months, a number of readers have requested a review of AEA's FAX program and a comparison to a proven performer, PC HF FAX 6.0, by Software Systems Consulting (we reviewed PC HF FAX in this column in the April 1992 issue of *Monitoring Times*). So this month we'll do just that and end up with some "finds" for radio related software at can't-pass-up prices. So let's get started!

In the past few years the FAX machine has become the fastest growing new home electronics product. Once only for large companies and the rich, FAX is now starting to compete with the postal service! However, for us radio enthusiasts, the squealing/scratching sounds that we've heard for years on shortwave still carry mystery as well as useful weather data.

Getting Started

AEA-FAX version 2.6 is a program that allows you to decode, view, store and manipulate these FAX signals. It requires a PC compatible computer (PC/XT/AT), at least 512K of RAM, a CGA, Hercules, EGA or VGA video system, either dual floppy disk drives or a hard drive and a serial/RS232 port—in other words, a pretty standard PC set-up. Of course, a printer is required to get hard copy of what you view on the monitor.

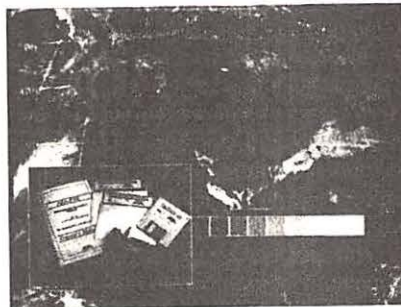
The program comes on both 3.5 inch (720K) and 5.25 inch (360K) disks. Included with the disks is a small decoder and an instruction manual. The program is loaded into your hard disk or floppies using a simple INSTALL program included on the AEA disks.

The decoder is approximately 3 inches by 2 inches and has a 25 pin "D" type connector at either end; one male and one female. The decoder attaches to the serial port of the computer with its female side. If your computer has a 9 pin serial connector, as many of the new ATs and laptops do, you will require an adaptor available cheaply through mail order or expensively from Radio Shack/computer shops.

"What about the other side's connector?" (Be careful! I *can* hear you.) Well, this is just one of the well thought out conveniences that AEA has included. If you use your serial port for other equipment—for example, a RTTY/AMTOR/CW decoder—then the connector on the other side of the decoder allows both the FAX decoder and the other decoder to be connected. No computer lifting or plug pulling required! It's a simple, but very useful detail.

From the side of the decoder comes a shielded cable with a miniphone plug on the end. I plugged it into the record output of my R-71 and I was ready to go...well, almost. But we'll get back to that after we see how the program performed.

Following the directions in the 28-page manual, I ran the program called FAX and was greeted with



a very nicely composed screen broken into four main areas: Main menu or command menu, system settings showing FAX settings (not to be confused with computer system settings), a directory of saved FAX files and finally a one-line user action required/computer in process dialogue section at the bottom of the screen.

Results That Can Be Seen!

Anxious to receive a FAX, I used the UP/DOWN arrow keys to choose the first item on the main menu, which inputs a FAX from your receiver. This clears the screen and displays a totally white/blank screen except for the bottom line. Here, in another example of a user friendly screen, the major FAX command functions are displayed along with the corresponding keys. For example, to change the signal sense, white background with black lines, or reverse, the F2 key is indicated at the bottom of the screen with either NORMAL or REVERSE next to it. This indicates the current state of this command.

This approach—displaying the command, operating key designation and current status on the screen along with the FAX as it's being received—is great, in my opinion! No more screen flipping. Well, almost none. You do have to go back to the main menu occasionally. But AEA has based the program around the FAX display screen.

A generic problem with receiving FAX is the critical signal tuning and level adjustments. One of the features I find most exciting is the oscilloscope-like tuning method which allows the listener to "see" the waveform and adjust for optimum decoding. Since it operates exactly the same as in Software System Consulting's program, you can find specific details in the operation, adjustment and use of this monitor feature in the April 1992 issue.

AEA has continued the same user-friendly "one-screen" approach by displaying the monitor scope on the bottom half of the FAX screen instead of requiring the user to change screens. Adjusting the receiver frequency and audio level (if adjustable) to put the signal between the monitor screen's two horizontal bars (thus setting the black and white levels), results in very good weather maps and GEOS cloud cover pictures.

AEA-FAX also provides for the levels to be set automatically with their "AUTO-GREY SCALE" command. In theory, the program is supposed to sense the incoming signal and adjust the levels automatically. I have not done extensive testing on this feature.

Another "auto" feature is the program's ability to recognize and adjust the IOC (index of cooperation), and Lines per Minute parameters. This AUTO mode sounds very useful especially coupled with the timetable feature. This allows the listener to set times, like on an alarm clock, for unattended FAX reception. In addition, there is a pull down help menu for most functions and commands which is a real aid and not just a gimmick.

FAXual Problems Encountered

Once set-up and tuned correctly the results were very good. But for the first *two hours* of trying I couldn't receive *anything* with AEA-FAX! I had followed all directions from the manual exactly. I went over them three times. But still no image. And herein lies the weakest part of AEA-FAX—the manual. It is 28 pages long; too short for the experienced user who is looking for more and too long for the novice who wants to see his/her first image.

Worse than that, it does have typographical errors. One so severe that it cost me those two hours. Remember when we were going over the discussion of serial port connector sizes above (9 pin and 25 pin)? Well, since my computer has a 9 pin on serial port 1 (com 1) and an AEA-FAX matching 25 pin connector on serial port 2 (com 2), I hooked it up to port 2 and followed the instruction on page 7 of the manual to change the program to look at port 2 for the decoder. As per the manual, I loaded the program with FAX-2.

At first I got a bad command message and the program would not load. Then I tried FAX 2 and the program loaded, except unbeknownst to me it was still looking to port 1 for input. The program does not display the active port number. Only when I used an adapter and went to port 1 did the program work, and work well. Page 14 is correct and page 7 is wrong. Too bad it wasn't in the opposite order; it would have saved me a lot of time.

Some outstanding features, such as the auto modes, are buried in the manual and not highlighted—not good for a product that costs \$100. The excellent user-friendliness of the AEA computer program itself is let down by the manual which is its weakest part.

How Does AEA-FAX Compare to SSC's PC HF FAX?

Wow! First, they are both excellent programs giving listeners the addition of a new mode of

reception. PC HF FAX includes a fully loaded database of FAX stations, frequencies, times and type of transmission. This can be coupled to its alarm-clock unattended reception function. Color, image rotation and image contrast/brightness histograms are all there for the experienced user, or for when novices become experienced. For flexibility, total image manipulation, FAX frequencies and schedules and especially program documentation, the SSC product is superior. Their documentation alone is worth more than a quarter of the program's price!

However, there are always two sides to the coin. The AEA-FAX program is much more user-friendly in its on-screen displays. Its "auto" input modes, single screen approach and help screens are very positive features, especially to a beginner.

One incidental discovery indicates how similar the programs are. Not only are the monitor screens very similar, but the decoders appear to be interchangeable and work with each other's program. The user will have to decide based on his experience and depth of involvement in FAX image presentation, which program is right for him. Both packages perform very well and you will not be disappointed.

AEA-FAX is available for around \$100 from Advanced Electronic Applications, Inc., P.O. Box C2160, 2006-196th St. SW, Lynnwood, WA 98036, (206) 774-5554 or from an AEA dealer. PC HF Facsimile 6.0 is available for \$99 from Software Systems Consulting, 615 S. El Camino Real, San Clemente, CA 92672, (714) 498-0568. See their ads in *Monitoring Times* for the latest details.

Peripherals

At a recent ham show I cruised the stands looking for software that would be of interest to us as monitoring people. I found RATEK selling their catalog of products on a floppy disk. It included not only their radios, publications and software on it, but also a database/word processor (and other interesting files). For instance, I found files on computer related computer bulletin board locations and telephone numbers, longwave beacon frequencies and more. All files can be added to, modified, searched and printed—not bad for a few dollars. Give RATEK a call for details at (203) 792-6541, or drop them a line at Box 2098, Danbury, CT 06813-2098; and remember to mention "Computers and Radio" and *Monitoring Times*.

And to round off this month's advice, check your local discount club like Pace, Sam's or BJ's for freebie computer publications. Pace was recently giving out free copies of *PC Novice* magazine. It's full of answers to the most asked questions about the PC: using, upgrading and accessories. Keep checking those ham shows for computer "buys"—an inexpensive way of getting sophistication and power into your radio hobby.

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Choosing and Using a VOM

There is nothing so ordinary but so necessary in the home workshop as a volt-ohmmeter (VOM). These instruments, which measure resistance, dc voltage, ac voltage and current, are available in many forms and in a wide range of prices.

A beginner can easily become confused when he or she selects that first VOM. The question arises concerning whether to buy a digital or an analog type of instrument. There is also the matter of price versus quality. How many features do you really need in your VOM? That is still another point to ponder. It's fair to say that the greater the number of "bells and whistles," the more costly the meter will be.

Digital or Analog?

Some say that this is a digital world. I don't agree. I think we are caught up in a blend of digital and analog trends. Personal choice will no doubt influence you when you select your first VOM, or perhaps a replacement unit. I must have been "born 50 years too soon," because I still prefer analog instruments for some applications.

I admit the basis for my choice is purely psychological. For example, I wouldn't consider using an analog frequency meter, but on the other hand I dislike digital watches. There are times when I want to see what is to the left and the right of the indicating needle on a meter face or watch dial. It's part of my "planning ahead" mental process. This doesn't mean I'm right — just set in my ways! Your preference in this regard will dictate which of the two styles of VOM you will buy.

VOM Accuracy

Even though an analog VOM, such as the popular Simpson model 260, may be rated for 5% accuracy of calibration, the resolution of some meter faces will not allow you to utilize the rated accuracy. Also, what you read depends in part upon the angle at which you view the meter face, the thickness of the needle and the spacing between the meter-face numbers. The smaller the meter, the more this problem is compounded.

A digital VOM, on the other hand, shows but

one set of numbers on its LCD (liquid crystal display). What you see reflects the inherent accuracy of the instrument. This is characteristic of any digital readout system, whether it is a VOM, frequency meter, receiver or transceiver. Persons with poor vision will fare better with a digital VOM. This is yet another consideration when buying your meter.

Ohms-Per-Volt Ratings

All VOMs come with an "ohms-per-volt" rating. Analog VOMs may have a collection of ratings that run from, say, 2000 to 50,000 ohms, depending upon the brand and style of instrument. The more sensitive the movement of the internal meter, the higher the ohms-per-volt rating. A basic movement of 0-1 mA might yield a 5000 ohms-per-volt rating, whereas a meter with a 100-microampere movement could provide a 50,000 ohms-per-volt rating.

The exception is in the case of VTVMs (vacuum-tube voltmeters), which have input resistances of 1 megohm or greater. FET (field

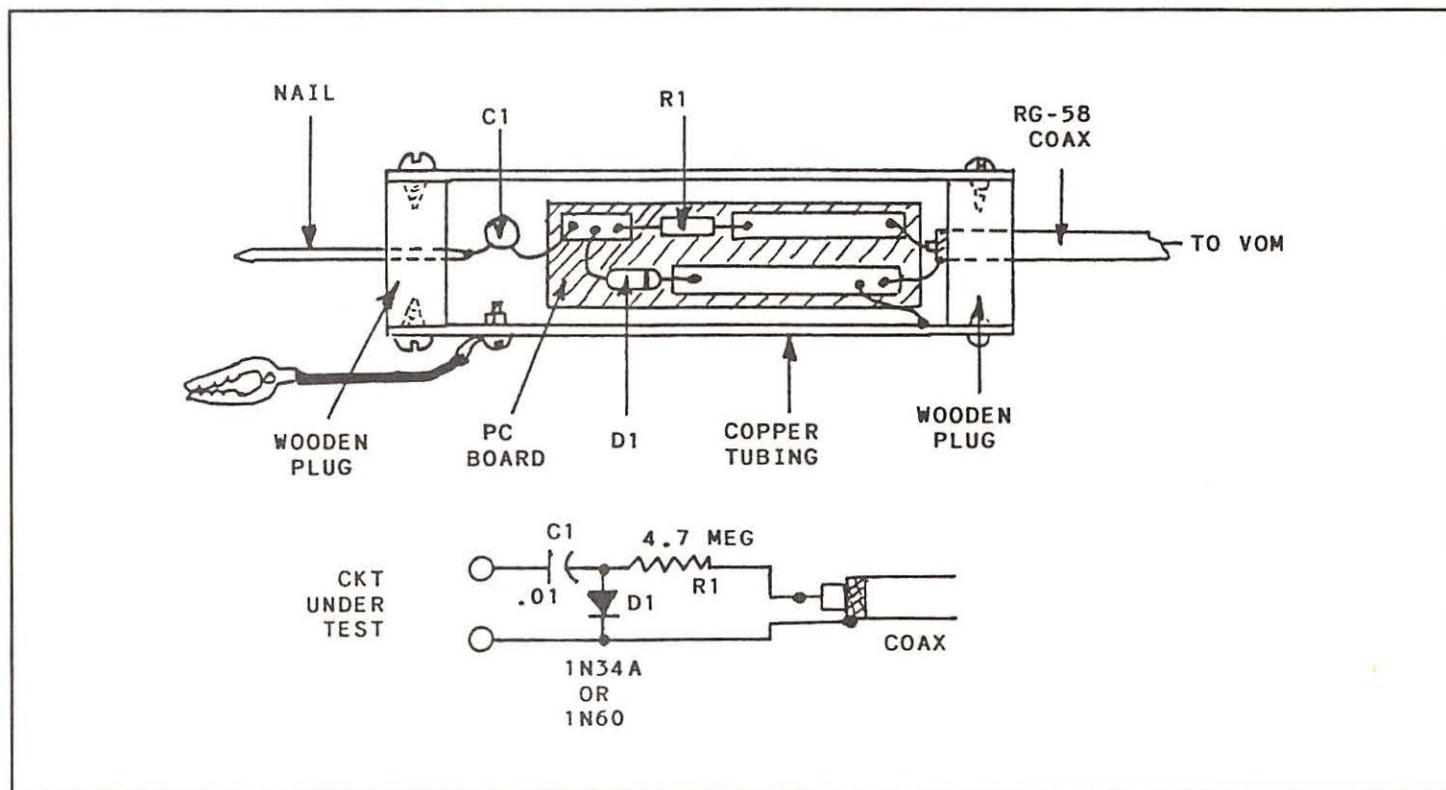


Figure 1: Pictorial and schematic diagrams of the RF probe. RG58 coaxial cable is used for the lead between the probe and a VOM. C1 is a disc ceramic capacitor. R1 is a 1/4-watt carbon resistor and D1 is a 1N34A germanium diode. This probe is designed to be used with VOMs that have an ohms-per-volt rating of 1 megohm or greater.

effect transistor) VOMs also have a high input resistance of a megohm or more. Digital VOMs also have high input resistance ratings.

Why might we care about the ohms-per-volt rating? Well, the lower the number, the more the VOM loads the circuit under test. This is not desirable, because it creates erroneous voltage readings in certain sensitive circuits, such as the grid of vacuum-tube amplifiers and the gate of FETs.

Suppose, for example, you want to measure bias voltage at the grid of a tube type of audio amplifier. Your VOM is a 5000 ohms-per-volt unit, but the tube grid has an impedance of 1 megohm. The bias voltage has only a few microamperes of current. When you attach the test leads of your VOM you are placing 5000 ohms in parallel with the circuit. Additional current now flows, but through the VOM. This pulls down the bias voltage and causes a false reading, or no reading at all. This does not happen when we measure voltages with high current reserves, such as a 12-volt car battery, the 120-volt ac line or even a 9-volt transistor radio battery.

Fortunately, you may not encounter many critical-circuit situations during your routine shop work, but you should be mindful of the potential problem when buying your VOM. An instrument with a high ohms-per-volt rating (50,000 ohms or greater) is recommended.

Measuring RF Voltages with a VOM

VOMs with a high ohms-per-volt rating can be used with an RF probe to measure RMS (root mean square) signal voltages such as those found in oscillator and RF amplifier circuits. The RF probe converts RF (ac) voltage to dc voltage by means of a rectifier diode. The resultant dc voltage is measured by your VOM on one of its dc voltage ranges. Most homemade probes work well up to about 200 MHz. Figure 1 provides a circuit you can duplicate.

RF probes provide accurate readings only if the RF voltage is undistorted (a pure sine wave), or without harmonic currents. However, useful comparative measurements can be made, even if the waveform is distorted. For example, you can do circuit tracing, stage to stage, in an effort to learn where the waveform is lost or too low in amplitude. In other words, there should be more signal at the output of an amplifier than appears at the input. These relative readings are used in troubleshooting circuits.

A Digital Caution

The liquid crystal displays in test equipment are sensitive to large changes in heat. Sustained bright sunlight also affects the LCDs. The display can turn black and render itself unreadable. This is brought about by chemical changes within the display block. Most of the time the LCD will return to normal when placed in a dark, cool location. However, I have one rather expensive digital VOM that did not recover after being exposed to bright sunlight a number of times. The manufacturer wanted as much money to replace the LCD block as I would have paid for a new digital VOM.

Summary

We have examined the primary points to consider when buying and using a VOM. I have a variety of these instruments in my shop. Some are older laboratory-grade Hewlett-Packard VTVMs. I also have two mid-priced digital VOMs. The unit I like best and use most often is a battery operated analog VOM from Radio Shack. It is a Micronta model 22-214A and has a 50,000 ohms-per-volt rating for dc measurements. Radio Shack also sells some moderately priced digital VOMs. The choice is yours to make!

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Easier Memory Expansions for the PRO-2004/5/6 and Many Other Scanners

Years ago, a scanner with *any* memory at all was a marvel, but 50-400 channels is nothing to holler about now. Even 1,000 channels don't always do the job, especially now that computer interfacing has come of age. It was several years ago that I introduced my *Scanner Modification Handbooks, Vols 1 & 2*, which provided techniques to add 6,000 channels to the Realistic(R) PRO-2004/5/6 scanner series and 3,000 channels to the PRO-37, 34, 32, 2021, 2022 and 1,500 channels to the Uniden BC-760/950XLT and BC-590/600XLT. Later, these techniques were refined to allow extended memories of 25,600, 12,800 and 6,400 channels, respectively. Costs were modest; the major drawback was labor. Still, following my instructions, hundreds of hobbyists extended their scanners' limited memories!

Now here is a technique to reduce the labor by half or more. We can do away with the separate board and 24-wires that were required for the "huge" DIP static RAM chip. Thanks to tiny surface mount memory chips, we just remove the scanner's stock memory chip and replace it, almost pin-for-pin, with a new one! Make a couple of trace cuts on the scanner's printed circuit board; add a jumper or two; and route six wires out to four external switches for 6,400, 3,200 or 1,600 programmable channels for your scanner. Here are the fundamentals:

Each of the above scanners uses a 16-k (2k x 8) surface-mount Static Random Access Memory (SRAM) chip that can be identified by one of these numbers: uPD446G-15; TC-5517CF-20;

LC-3517BM-15; or MB-8416-20LPF. If your scanner has one of these 24-pin surface-mounted chips on or near the digital/logic board, then it's a candidate for my Alzheimer's cure. The scanners mentioned above are the only ones, to my knowledge, which use this SRAM chip and qualify for this latest enhancement. If your scanner has fewer than 100-channels, it probably doesn't, so don't bother looking unless you're innately curious. Thanks to Tom Lambert of Portland, Oregon, for reminding me that this upgrade is now feasible!

Once you've identified the chip, you'll want to acquire the replacement, a 32k x 8 SRAM (256-k) in surface-mount technology (SMT) style, a generic part number for which is: 62256LFP12. MOSEL makes one: MS62256L-10FC; Motorola's is MCM60L256AF10, and NEC's version is uPD43256AGU-12LL.

The last two numbers in these part numbers are a code for the speed of the chip and are not too critical. Anything resembling -10, -12, -15 or -20 is okay. The larger number/slower speed chips are less expensive.

Hitachi, Samsung and other manufacturers produce these chips, too, so instead of remembering an exact part number, just tell your favorite supplier that you want "a 256-k static RAM chip, Low Power, flat-pak/surface-mount style, organized as 32k x 8 bits, with 28-pins," and they will get you the right thing. Offer the above part numbers if they need a cross reference.

Besides this SRAM chip, you'll need four switches that could be as simple as SPST toggle types, or maybe a 4-segment DIP Switch, or even a BCD-encoded switch. If you are green on switches, then stick with toggle switches or DIP switches to access the extended memory blocks.

Now, before you throw in the towel, please understand that extending the memory of your scanner is almost as simple as removing the stock SRAM chip and installing the new one. *Almost*. The stock chip has 24 pins while the new one has 28 pins. This adds a slight complication, depending on your scanner. For instance, the PRO-2005 and PRO-2006 already have 28-pin pads right where the 24-pin chip will be removed! This makes the job almost a snap. For the others, including the PRO-2004, you'll have to bend UP four of the pins of the new chip and solder the remaining 24 pins to the existing 24-pads.

Also note that *all* scanners will require minor trace cuts, a short jumper or two, plus six wires from the area of the new chip to run out to the four switches and four 100-k resistors. The worst part will be getting your scanner torn down and removing the old chip. So let's get to work.

PRO-2005 & PRO-2006 ONLY: Remove the front panel from the body of the radio; remove the Logic/Display Board from inside the front panel. Desolder and remove the chrome metal shield that covers the back side of this board. Locate and remove IC-505. If you're handy with desoldering techniques, you can try to remove this chip without destroying it. Otherwise, a good bet is to first snip each pin until the chip comes loose. Then carefully desolder the cut pin ends from the pads and clean all pads so they are bright and shiny. Desoldering wick and a very thin-tipped soldering pencil are mandatory!

Make four trace cuts as follows: one on each side of Pad 24 so that it is completely isolated. Then make a trace cut so that Pad 21 is completely isolated. Finally, cut the trace to the previously unused pad just above old Pad 1. (This will become Pad 2 for the new chip.) Solder a jumper wire from new Pad 28 to an exposed solder point on the trace that was cut to isolate old Pad 24. A perfect spot is one of the component solder pads for the trace that connects C511, R525 and C513

(see Figure 1). Skip ahead now to ALL SCANNERS.

PRO-2004 and Other Scanners: Locate and remove the stock SRAM chip. Refer to the chip removal guidelines given for the PRO-2005/6 above. After the old chip is removed, cut the appropriate traces so

Figure 1: PRO-2005/6 CONNECTIONS & TRACE CUTS

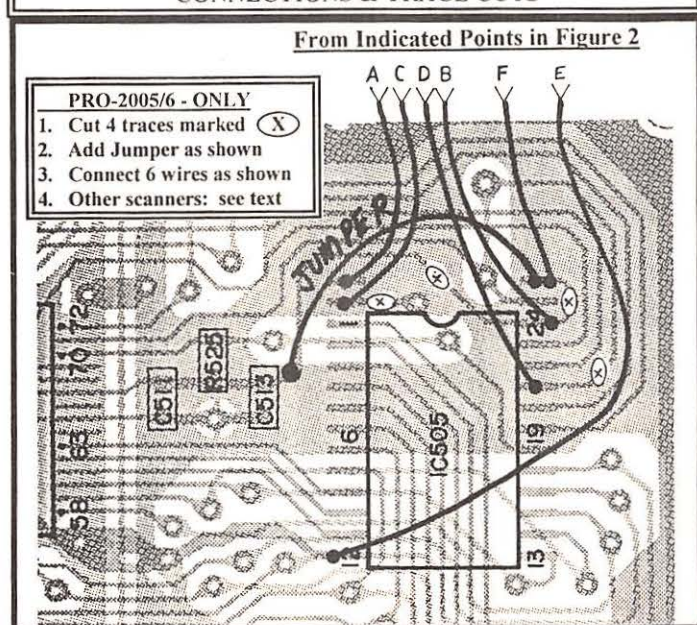
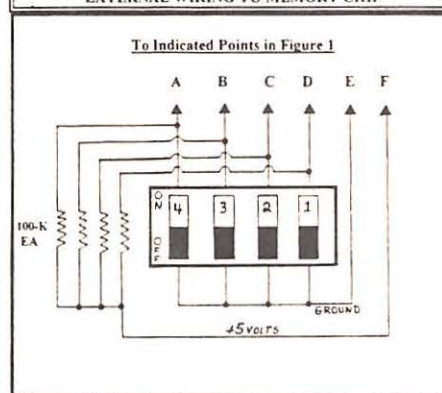


Figure 2: EXTENDED MEMORY EXTERNAL WIRING TO MEMORY CHIP



that Pads 21 & 24 are completely isolated on the board. Continue below.

ALL SCANNERS: Lay the new chip down on the old pads so that all pins line up with their pads beneath them. Note that Pad #12 for the old chip will get Pin #14 of the new chip. Likewise, Pad 13 of the old chip will receive Pin 15 of the new chip. Adjust the positioning of the new chip so that perfect pin alignment is achieved. (NOTE: With exception of the PRO-2005 & 2006, all other scanners will require that you bend up pins 1, 2, 27 & 28 of the new chip before soldering it to the pads. These four pins must not touch anything!) Then solder one corner pin of the chip to its pad. Ensure that alignment remains perfect, and solder an opposite corner pin to its pad. If all is well, solder the remaining pins to their respective pads.

Solder suitable length wires to each of new pads/pins 1, 2, 14, 23, 26 & 28 and route these six wires out to where your memory block selector switches will be located. Wire the switches and resistors as shown in Figure 2. If you use DIP switches, you can first install somewhere on the scanner a standard IC-DIP socket to match the pin requirements of the DIP switch, and this will allow your DIP switch to be quickly plugged in and disconnected. Several spare DIP switches can be kept handy, preset to your preferred memory blocks! DIP switches allow a neat, tidy and very condensed installation, too!

ALL SCANNERS OTHER THAN THE PRO-2005 & 2006: Solder a jumper wire from the elevated new Pin 28 to a solder joint on the trace that was cut away from old Pin 24. Solder a jumper wire from the elevated new Pin 27 to a solder joint on the trace that was cut away from old Pin 21.

OPERATION: This variation of the Extended Memory Modification will yield sixteen blocks of regular, ordinary channel — each block programmable with however many channels the scanner had before. The PRO-2004/5/6 will have 6,400 channels; the BC760/950/590/600XLT will have 1,600 channels and the rest will have 3,200 channels. You may never use all these channels, but the quantity is NOT the main idea here! Instead, it's to gain the sixteen blocks of 400, 200 or 100-channels each, which essentially gives you sixteen identical scanners, even though they can only be used one at a time.

The block concept is an elaboration of the bank concept, but it allows up to sixteen different complete programs for your scanner. You can dedicate one block to railroads, another to aero;

SW#4	SW#3	SW#2	SW#1	BLOCK ID CODE IN CH-1	MEM BLOCK#	BINARY EQUIV
OFF	OFF	OFF	OFF	1000.000	00	0000
OFF	OFF	OFF	ON	1001.000	01	0001
OFF	OFF	ON	OFF	1002.000	02	0010
OFF	OFF	ON	ON	1003.000	03	0011
OFF	ON	OFF	OFF	1004.000	04	0100
OFF	ON	OFF	ON	1005.000	05	0101
OFF	ON	ON	OFF	1006.000	06	0110
OFF	ON	ON	ON	1007.000	07	0111
ON	OFF	OFF	OFF	1008.000	08	1000
ON	OFF	OFF	ON	1009.000	09	1001
ON	OFF	ON	OFF	1010.000	10	1010
ON	OFF	ON	ON	1011.000	11	1011
ON	ON	OFF	OFF	1012.000	12	1100
ON	ON	OFF	ON	1013.000	13	1101
ON	ON	ON	OFF	1014.000	14	1110
ON	ON	ON	ON	1015.000	15	1111

others still for military, medical, emergency, etc.; several for scratch and messing around; and a couple for the real serious stuff. In other words, an extended memory allows greater flexibility in setting up a scanner to do the things you want it to do! You're not obligated to use all 1600-to-6400 channels, but you will find immediate uses for the sixteen different blocks! And here is how those blocks are accessed:

The four switches yield sixteen combinations of settings, from all OFF to all ON. Each combination allows one block of original-style programmable channels; when you change blocks, one is switched out and another switched in. The actual scheme is binary, which might not be familiar to all scannists, but it is the easiest counting system of them all — easier than the decimal system!

Here is a simple binary counting exercise: Make a closed fist with the back of your right hand facing you. This signifies zero (0000). Now raise the little finger; that's 1 or (0001). Close the little finger and raise the ring finger; that's 2, or (0010). Now keep it raised, but raise the little finger again; that's 3 (0011). Now close both those fingers and raise the index finger; that's 4, (0100). Keep it raised, and raise the little finger again for 5, (0101). Now keep repeating this pattern while looking at Table 1 and you'll comprehend the binary counting scheme, which is how the block switches work.

If you are uncomfortable with the binary counting system, it will help to program a coded frequency into Channel 1 of each block for a quick reference to which block you're in at any time. If we call all switches OFF the "home block," then a frequency in Ch-1 such as 1000.000 will clue you to block 00 while a frequency of 1015.000 programmed into Ch-1 of the block with all switches ON will clue you to Block 15. Again, refer to Table 1 for the pattern and program clues. If your scanner won't accept 1000 MHz freqs, then use something else, like 900.000 - 915.000 or 500.000 - 515.000.

You should develop a standard procedure of turning OFF all the Block Switches when the scanner is not in use because those 100-k resistors can draw a minuscule amount of current from the

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memory retention circuit when the scanner is disconnected from power or batteries are temporarily removed.

Some scanners are much more powerful than others; notably the PRO-2004/5/6, which will not only store all those frequencies in the SRAM, but also custom settings of Mode, Delay and Lockout. Other scanners may store only frequencies in the SRAM chip and custom channel data in the CPU's RAM. In that case, a Lockout and/or Delay set to one channel in a certain block will LockOut or delay that same channel in all blocks. Sorry, that's a function of the scanner's design and can't be helped. The PRO-2004/5/6 are exempt from this limitation because the SRAM stores all pertinent channel data with exceptions of Priority and selected scan banks which are stored in the CPU's RAM.

I will provide technical support for this and other modifications through my computer bulletin board, *The Hertzian Intercept BBS* at (619) 578-9247, 300-19,200-baud, 8N1, after 5:30pm and before 1:30 pm, PDT, weekdays and 24-hrs on weekends & holidays. The phone is for business only between 1:30pm - 5:30pm, so please don't call then. The phone receptionist cannot offer technical assistance. Limited mail support can also be available if you don't have a computer and modem. Follow the instructions and you're not likely to encounter trouble, but if you do, don't abandon hope. 73 until next month...

Transmission Lines: An Important Link in the Signal Path

The path which a radio signal takes from the antenna to the receiver is known as the "lead in," the "transmission line," or the "feedline." This month we'll cover some important ideas concerning these lines.

Any Line Causes Some Loss: Any transmission line attenuates signals (reduces their strength) to some degree. Open-wire line (ladder line) has very low losses compared to the most common line: coaxial cable. TV twinlead is not as low in loss as open-wire line, but significantly lower in loss than most coaxial cable. Of the types of coax in common use, hardline gives the lowest losses, foam-dielectric is next lowest, and ordinary solid-dielectric polyethylene is the highest.

The Frequency Utilized for Reception is Important: At or below the HF band, unless the line is quite long (well over 100 feet), there is usually no difference in signal readability whether we use low-loss line or regular (medium loss) line. At VHF, UHF and higher frequencies, you should use low-loss line except with strong signals on very short runs of a few wavelengths, usually 20 feet or less.

A Line can Generate Noise: Antennas and transmission lines, as with any conductor which passes a signal, add very low levels of electrical noise to the signal. Below VHF these noises are inconsequential, but at VHF and higher they increasingly interfere with the reception of weak signals.

Although there is not much that we can do to reduce the noise generated in the antenna, the effect of transmission-line noise on reception can be reduced by placing a low-noise preamplifier between the antenna output and the input to the transmission line. In some instances, particularly with long lines, this improves reception dramatically. Keep in mind, however, that when strong signals are present in the antenna's output they may overload the preamplifier causing desensitization and/or intermodulation distortion.

Aging or Injury of the Line: Often, used cable is as good as new cable; age alone doesn't necessarily cause high losses. Yellow or bluish color in the inner insulation may indicate high losses. Cracks in the outer insulation can let moisture enter the line and this invariably causes

deterioration and excessive signal loss. Bulged or flattened cable is very likely to be defective.

Testing the Quality of a Line: To test the amount of attenuation caused by a feedline, short the line at one end and connect an SWR meter to the other end. Testing SWR requires a source of radio-frequency signal such as a radio transmitter, which is no problem for amateur or CB radio operators. Monitoring buffs with no source of RF power can use an SWR analyzer, available from MFJ Enterprises. Energize the meter with RF of the frequency at which you will use the line.

The short at the end of the line should produce a high SWR on the line; if a moderate or low SWR is indicated then the line has significant losses. An SWR of 9:1 or less indicates at least one dB loss (a barely noticeable amount), 3:1 or lower indicates 3 dB or more of loss, 2:1 or less indicates a loss of five dB or more.

Selecting an Appropriate Type of Line

HF and Below: In receive-only installations, on HF or lower frequencies, ordinary polyethylene coax works as well as lower-loss cable and is less expensive. With a long line (more than a few wavelengths in length), which is used for transmitting as well as receiving, foam-insulated coax, open-wire line or 300-ohm TV twinlead are preferable due to lower transmitted-signal loss when SWR becomes elevated at the antenna-feedline junction.

Above the HF Band: Above the HF band you should routinely use foam-filled coax because of its low losses and ease of installation. Ordinary polyethylene filled coax may be OK for very short runs where all signals of interest are strong.

TV twinlead or open-wire line are even lower-loss alternatives to foam coax for long runs, but when choosing among the low-loss lines remember that foam coax is relatively expensive, twinlead is relatively inexpensive, and open-wire line can be as expensive as coax unless you make it yourself (see the ARRL *Antenna Book* for information helpful in constructing this line; 225 Main St., Newington, CT 06111).

On the other hand, both open-wire line and twinlead are difficult to install; they should be mounted away from walls, metal, the earth and other cables or wiring, and should not be coiled.

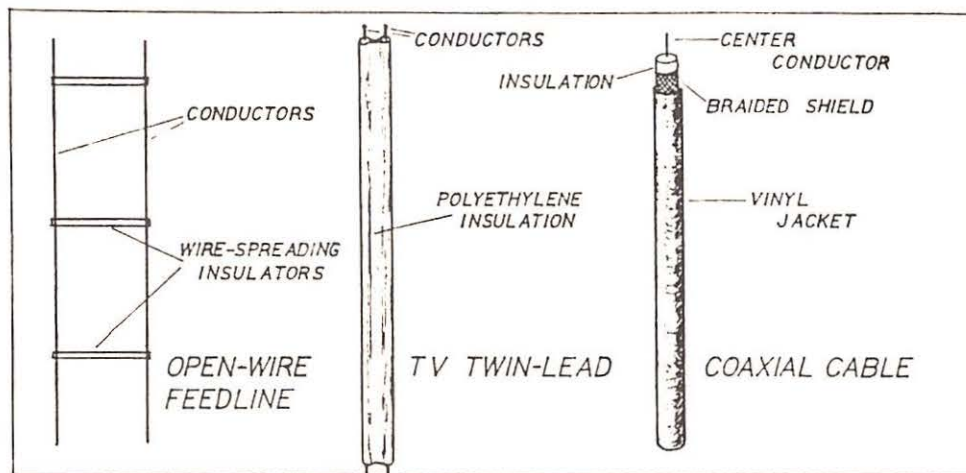
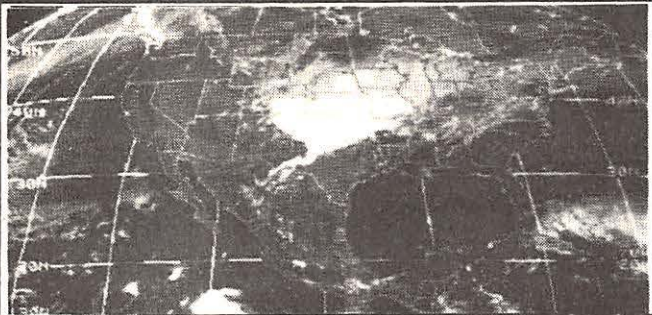


FIG.1. OPEN-WIRE FEEDERS GIVE LOW SIGNAL-LOSS BUT COAX OFFERS SEVERAL ADVANTAGES (SEE TEXT)

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Depending on the installation and application, they may require a balun at one or both ends. Rain, snow, ice or accumulation of dirt or dust on the twinlead will cause increased losses. Coax, on the other hand, can be run along or through walls, metal or earth, it can be coiled with no problems, and is not affected by dirt or moisture on its outer insulation.

Feedline Impedance: For HF receive-only applications we need not be too concerned about matching the feedline impedance to the antenna or to the receiver. At VHF and above matching is more important, although the use of a low-loss line is considerably more important. You will usually get better reception using a mismatched, low-loss line than with a well-matched, high loss line. Mismatched lines can cause ghosts in TV reception.

Radio Riddles

Last Month

What Noise Annoys an Operator? Last month I asked you if the following statement is true: "Just about everything that is important to say about antennas, transmitting or receiving, can be

reduced to a concern at the receiving site with the relative levels of the desired signal in relation to the competitive electrical noise and interference."

To answer this question let's consider that the goal of radio communication is the successful reception of the information contained in the signal. To do this we must be able to "detect" the desired signal above any noise present at the detector. Noise present at the detector includes atmospheric noise, cosmic noise, signals from interfering stations, and noise generated within the receiver.

If the radiation pattern of a transmitting antenna is such that it launches little of its signal in the direction of our receiving antenna, then that signal is not likely to be received with sufficient strength to be detected over the noise at the receiver.

On the other hand, our receiving antenna must have a reception pattern which has sufficient gain in the direction from which the desired signal comes to insure that that signal can successfully compete with the noise present at the receiver. Of course, some of this noise is the received noise, and so we must insure that the reception pattern of the receiving antenna is minimally responsive in directions from which serious noise could be received.

Another important consideration for receiving antennas is that local, electrical noise sources, such as house wiring or electrical machinery, can create electrical noise fields. In siting the receiving antenna we must not mount it in such a field, but rather sufficiently far away that this noise is not received at levels that prevent detection of the desired signal. If the antenna is mounted far from the noise field, then coax line can be used to lead signals from the antenna through the noise field and on to the receiver without picking up significant noise.

And so, when we select our transmitting or receiving antennas, we must consider gain, radiation and reception pattern, and siting all with respect to getting the desired signal to the receiver's detector sufficiently above the noise level for successful detection.

This Month

It is commonly reported that horizontally polarized antennas are more quiet than vertical antennas because they receive less noise. Do they, and if so, why?

We'll have the answer to this month's riddle in next month's issue of *Monitoring Times*. Til then, Peace, DX, and 73.

MT

Q. My cordless telephone base is in a metal building which limits its range. Are there external antennas that can be added? (Gary Hickerson, Ft. Smith, AR)

A. There used to be, but the FCC frowned upon them. I haven't seen them advertised for quite some time. A simple vertical dipole could be made out of wire or aluminum; it would be ten feet in length and fed at the center by coax.

The cable would be connected in the base in place of the antenna and loading coil (if there is one). The shield would be grounded to common metal of the phone.

Some improvement as well might be made to the handset by using a longer resonant antenna. Since a quarter wave whip would be five feet in length, that might be cumbersome; try a telescoping whip like the Grove ANT-8, or find the longest cordless replacement whip that will fit.

Q. Is it possible that I am correct in observing that UHF stations come in on my receiver better after I installed aluminum screens? (Robert Brock, Phoenix, AZ)

A. Any metallic mass can become a reflector, director or shield, altering arriving radio waves. The effect on your radio's antenna will depend upon the frequency range, size of the screen and relative distance between the radio and the screen.

Q. I have trouble tuning in single sideband on my Realistic DX-440; the tuning control is too critical. Would changing the value of the BFO tuning potentiometer help? How about using my dual-trace oscilloscope as an aid? (Mike Ventrella, Hanover Park, IL)

A. While you could hook up the oscilloscope as a tuning aid, the difficulty would not be worth it; your ears will still be the best judge of audio quality.

Any tinkering with the BFO circuit will doubtlessly require realignment of the BFO coil (an easy task if you know what you're doing).

You may wish to measure the resistance of that pot, then add a series resistance of the same value to one leg of the pot. This would in effect reduce the tuning range, giving you more of a "fine tuning" effect.

Another possibility would be to put a second pot of much less resistance in series with the

original; this second pot would give you fine tuning while the original would be coarse tuning.

Q. How can I improve distance reception with an indoor antenna on my Sony ICF2010? (Brad Haroldson, Sykesville, MD)

A. Indoor antennas are always restricted by their confinement. For mediumwave broadcast reception and even shortwave as well, they are too short to be resonant, they endure interference from electrical wiring and appliances, and they are shielded from incoming signals by metal building construction and ducts.

There are "boosters" which help, including the Grove TUN-4 MiniTuner for all frequency ranges, the mediumwave "Select-A-Tenna" from C. Crane Company (147 Watson Lane, Fortuna, CA 95340), and the loop antenna system from Palomar Engineers (Box 462222, Escondido, CA 92046).

Q. What kind of transformer and lead-in should I use for 800 MHz monitoring on an old TV set? (Richard Hamann, Fort Dodge, IA)

A. Exactly the same as if you wanted to watch UHF TV. A standard VHF/UHF TV balun transformer and low-loss coax like RG-6/U. Even the antenna will be a UHF-TV type, but mounted with the elements in a vertical plane to receive communications rather than horizontal for watching TV.

Q. Can I add an external synchronous detector to my shortwave receiver (follow-up to Bobby Joe Copeland, November 1992 column)

A. While the answer is still the same—all synchronous detectors must be internally connected—Mike Agner reminds me that there are a number of internally-connected products which still remain external to the radio. Check these sources to see what they presently have in their catalogs.

Kiwa Electronics, 612 S. 14th Ave., Yakima, WA 98902 had a synchronous detector called "MAP" retailing, as Mike recalls, for about \$350.

Steve Johnson, PO Box 3420, York, PA 17402-0420 was offering kits and factory built synchronous detectors built around the popular Sony chip.

Finally, but certainly not least, the oldest — and leading — source of add-on synchronous detectors is Sherwood Engineering, 1268 S. Ogden St., Denver, CO 80210.

Q. I use a 27 MHz CB antenna for mobile shortwave listening in the 6-16 MHz range. How can I change its resonance to work better there? (Michael Oreskovic, Burlington, Ont.)

A. "Loaded" whips—those that have coils in them for resonance—are very frequency selective. If you designed one for 6 MHz it would be very signal-deficient at higher frequencies.

You would be better off using a full-length, quarter-wave CB antenna located on a bumper mount; this way you would get more signal over a wider frequency range and it would still be close enough to the ground to avoid snagging birds and low-flying aircraft!

Q. How can I tell whether an interfering signal is on its assigned frequency, or whether is an image, a harmonic or intermodulation? (Norm Blitch, queried on the MT BBS)

A. For its assigned frequency, try looking it up in a directory or database; call the licensee to confirm his frequency; consult a frequency allocation table to see whether that service should be on that frequency.

An image will be displaced from its actual transmission frequency by twice your receiver's intermediate frequency (IF). For example, I constantly hear VHF-AM aircraft signals at 154.875 MHz. Since my Bearcat has a 10.85 MHz IF, I know that the original transmission occurs on 133.175 MHz (2 x 10.85, subtract from 154.875).

Harmonics are rare unless the transmitter is very close, or the power is very high. Third harmonics (three times the desired frequency) are the most common because an antenna is often resonant at its third harmonic, emphasizing radiation there as well. A 158.1 MHz pager might be heard at 474.3 MHz, and 9-11 MHz shortwave stations are commonly heard via skip in the 30-35 MHz band.

Intermodulation is a product of two or more signals mixing. The sound is often distorted, and may contain mixed audio. Intermod is reduced when an attenuator is placed in the antenna line, 3 dB reduction for every 1 dB of attenuation. In a dense metropolitan area, a 6 or 10 dB attenuator may work wonders for reception.

Q. With Armed Forces Radio and Television Service disappearing from shortwave, where will college students abroad get football and

Bob's Tip of the Month

Permanent Backlight for the BC200XLT

This modification may void your warranty. *Monitoring Times* assumes no responsibility for damage caused while attempting this modification.

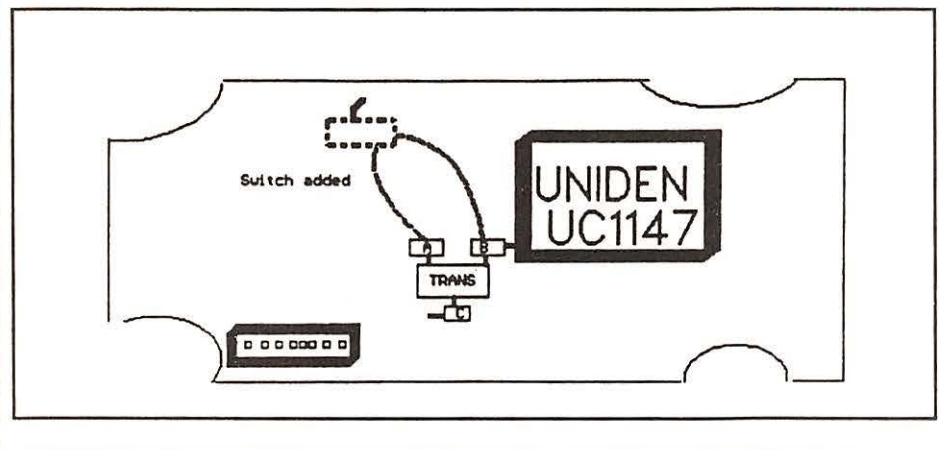
Owners of the Uniden BC200XLT handheld scanner are always asking how to defeat the time-out on the backlight switch. While it can be done, the reason for the automatic time-out is to avoid unnecessary battery drain when the light isn't absolutely necessary.

The club magazine *American Scannergram* recently addressed one easy method from Bob Schwerdtman for those who are talented in small-circuit modifications.

After removing the battery and cabinet screws, and removing the back and unplugging the top circuit board, locate the microprocessor chip marked UNIDEN UC1147.

Just to the lower left of that chip is the backlight switch transistor; connecting a switch across its two leads as shown on the accompanying diagram allows continuous on/off operation of the light.

It is up to the owner to decide what kind of switch will fit his needs — and the cabinet. Needless to say, these are very small components and the modification should not be attempted by anyone not familiar with microcircuitry.



basketball scores? (James Maharg, Oak Park, IL)

A. From their folks at home? There are still some AFRTS medium wave domestic broadcasts on military bases, and VOA might be a suitable alternative.

Q. How does RG-6/U cable TV coax compare with premium radio cable like Belden 9913? Ken Strickland, Eden, NC)

A. Very favorably, especially when you consider the difference in price. At 155 MHz (VHF high band), the Belden is only 1 dB better at 100 feet, and at 450 MHz UHF, the difference is less than 2 dB. You would be hard pressed to notice the difference even on weak signals.

I would recommend the more expensive Belden only if you are seeking extremely weak signals at 800 MHz or needed a run in excess of 100 feet at UHF.

Q. How can I acquire an AC adaptor for an old National Panasonic RL 594 receiver that uses four size D cells? (Ken Brady, Ghent, NY)

A. National Panasonic is a brand distributed only overseas; finding an original matching AC adaptor is unlikely. Any AC wall adaptor which supplies 6 volts DC and has the correct plug and polarity should work just fine.

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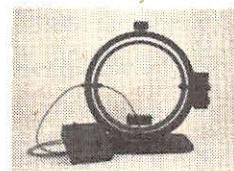
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Club Circuit

Welcome to ...

CARMA: Chicago Area Radio Monitoring Association

Contact persons Ted and Kim Moran report that CARMA has its meeting and newsletter on alternate months—a very clever and efficient arrangement. Meetings, held at area restaurants, sometimes feature guest speakers and special programs, as well as numerous free, detailed handouts and general information of interest to the radio hobbyist. Although the club's primary interest is public safety, it covers most areas of monitoring.

CARMA holds regular tours of radio related facilities like dispatch centers, communications sites, air traffic control centers, etc.

They have extensive computer and bulletin board system facilities at the club's disposal.

CARMA activities also include group research projects and support of public safety communications in the Chicago area.

The group boasts 250 active members and the number keeps expanding. The club is proud of its support for beginners and newcomers. Contact them at 6536 N. Francisco 3E, Chicago, IL 60645.

Wasatch Scanner Club

This newly formed club was founded in February 1993! Jon Van Allen says, "We hope to start a regular meeting by summer. We have published monthly editions of the *Wasatch Scanner Club Report* since February. We are planning a trip to Dugway Proving Grounds to monitor, and want to plan a visit to Salt Lake International Center Air Traffic Control.

"As with most clubs, we needed a central focus for our energy, and frequency lists for a comprehensive database. Everyone had a good list, but no one had them all! Now we feel we have a good frequency database on hand, especially in the federal area." The club's primary focus is on federal, public safety, and military monitoring.

Membership currently stands at 15, and activities are expected to increase along with the membership. Dues are currently \$10 per year, which includes the monthly newsletter, plus an annual frequency guide (*Wasatch Front Frequency Directory*) and access to the frequency database.

For more information, write Jon Van Allen KF7YN, 2872 W. 7140 South, West Jordan, UT 84084-2917.

Club Listings M-Z

Metro Radio System: Julian Olansky, P.O. Box 26, Newton Highlands, MA 02161, (617) 969-3000. New England states; Public Safety. *M.R.S. Newsletter*.

Michigan Area Radio Enthusiasts: Bob Walker, P.O. Box 81621, Rochester, MI 48308. Michigan & surrounding; All bands. *Great Lakes Monitor*.

MONIX (Cincinnati/Dayton Area Monitoring Exchange): Mark Meece, 7917 3rd St., West Chester, OH 45069-2212, (513) 777-2909. Cincinnati/Dayton area; Full spectrum SW and scanning.

National Radio Club: Paul Swearingen, Publisher, P.O. Box 5711, Topeka, KS 66605-0711. Worldwide; AM/FM. *DX News* 30 times yearly, sample for a 29 cent stamp.

NYC Radio Fre(ak)Qs: Joe Alverson, 199 Barnard Ave., Staten Island, NY 10307, 718-317-5556. NY boros & LI; VHF/UHF/HF utilities.

North American SW Assoc.: Bob Brown, Executive Dir., 45 Wildflower Lane, Levittown, PA 19057. Worldwide; Shortwave broadcast only. *The Journal*.

North Central Texas SWL Club: Alton Coffey, 1830 Wildwood Drive, Grand Prairie, TX 75050. Central TX area; All bands.

Northeast Ohio SWL/DXers: Donald J. Weber, P.O. Box 652, Westlake, OH 44145-0652. NE Ohio; SWBC and utilities.

Northeast Scanner Club: Les Mattson, P.O. Box 62, Gibbstown, NJ 08027, (609) 423-1603 evenings. Maine thru Virginia; UHF/VHF, public safety, aircraft, military. *Northeast Scanning News (NESN)*.

Ontario DX Association: Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada, (416) 853-3169 voice & fax, (416) 444-3526 DX-Change information svce. Predominantly Province of Ontario; SWBC, utility, MW, FM-TV, scanning, technical, propagation. *DX Ontario*.

Pacific NW/BC DX Club: Phil Bytheway, 9705 Mary NW, Seattle, WA 98117, (206) 356-3927. WA, OR, ID, BC; DXing all bands.

Pakistan SW Listeners Club: Mrs. Fatima Naseem, Sultanpura, Sheikhpura, 39350 Pakistan; Pakistan; SWBC.

Pitt City SW Listeners Club: L. Neal Sumrell, Rt. 1 Box 276, Sumrell Rd., Ayden, NC 28513-9715. Eastern NC; Shortwave bands. *The DX Listeners*.

Puna DX Club: Jerry Witham, P.O. Box 596, Keaau, HI 96749; Puna, HI; SW and MW.

Radio Monitors of Maryland: Ron Bruckman, P.O. Box 394, Hampstead, MD 21074. Maryland; VHF/UHF/HF utilities. *Radio Monitors Newsletter of MD*.

RCMA (Radio Communications Monitoring Assn.): Carol Ruth, Gen'l Mgr., P.O. Box 542, Silverado, CA 92676. North America, Europe, Australia; All modes above 30 MHz. *RCMA Journal*.

Regional Communications Network (RCN): Bill Morris, Public Info. Officer, Box 83-M, Carlstadt, NJ 07072-0083. 50 mile radius of NY City; 2-way Radio Public safety notification group.

Rocky Mountain Monitoring Enthusiasts: James Richardson, 11391 Main Range Trail, Littleton, CO 80127, 303-933-2195. Regional Rocky Mtn area; scanner monitoring.

Rocky Mountain Radio Listeners: Wayne Heinen, 4131 S. Andes Way, Aurora, CO 80013-3831. Colorado Front Range; All bands. Annual meeting calendar for an SASE.

Southern California Area DXers (S.C.A.D.S.): Don R. Schmidt, 3809 Rose Ave., Long Beach, CA 90807-4334, (310) 424-4634. California area; AM, FM, TV, scanner and shortwave broadcasting.

Southern Cross DX Club Inc.: G.P.O. Box 1487, Adelaide, SA 5001, Australia. Australia, New Zealand, South Pacific; All bands. *DX Post*.

SPEEDX (Society to Preserve the Engrossing Enjoyment of DXing): Bob Thunberg, Business Mgr., P.O. Box 196, DuBois, PA 15801-0196. Worldwide; SWBC, utilities. *SPEEDX* monthly newsletter.

Susquehanna City Scanner Club: Alan D. Grick, P.O. Box 23, Prospect St., Montrose, PA 18801. PA area; Scanning all bands.

Toledo Area Radio Enthusiasts: Ernie Dellinger, N8PFA, 6629 Sue Lane, Maumee, OH 43537. NW Ohio and SE Michigan; Shortwave, scanning, amateur.

Triangle Area Scanner/SW Listening Group: Curt Phillips, KD4YU, P.O. Box 28587, Raleigh, NC 27611. Central NC.

Wasatch Scanner Club: Jon Van Allen, 2872 West 7140 South, West Jordan, UT 84084. State of Utah. VHF/UHF. *Newsletter/directory*.

World DX Club: Arthur Ward, 17 Motspur Drive, Northampton, England NN2 6LY (in USA-Richard D'Angelo, 2216 Burkey Drive, Wyomissing, PA 19610). United Kingdom and worldwide. SW, MW broadcasting DX, FM & TV DX, amateur radio. *Contact*.

New Additions:

British DX Club: Colin Wright, 54 Birkhall Road, Catford, London, SE6 1TE, United Kingdom. UK and international. SW, MW, AM, FM DXing, pirate and clandestine radio. *Communication*. Sample 3 IRCs or \$2 US cash.

Central Indiana Shortwave Club: Steve Hammer, 2517 E. DePauw Road, Indianapolis, IN 46227-4404. Central Indiana; SW broadcasting, pirates, and the offbeat. *Shortwave Oddities*.

Friendship DXers Club: Ing. Santiago San Gil Gonzalez, C.DX.A - International, P.O. Box 202, Barinas 5201-a, Estado Barinas, Venezuela. International. DXing all bands. Cadena DX, YV-2-FSW, Sunday 1130-1330 UTC on 7113 and 14113 kHz. Membership free.

QSL Club de France: Patrick Frigerio, 40 Rue de Haguenau, 67700 Saverne, France. All bands. *Courrier* (in French). 6 bulletins, 42 FF, EEC 12 IRCs, elsewhere 16 IRCs.

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
June 4-6	Arlington, TX	Texas State Convention/John Fleet II, WA5OHG 6208 Preston Rd., Dallas, TX 75205.
June 5	Knoxville, TN	Knoxville ARC and Computer Fair/Angela Crigger, N4RPR 2707 Pine Hill Dr., Knoxville, TN 37932 (615) 694-9071. Location: Tennessee Valley Fairgrounds at Chilhowee Park, 8am-4pm, \$5 admission. Talk-in on 147.300+ 224.500.
June 5	So Burlington, VT	No Vermont Mid-Summer Hamfest/Joseph Tymecki, N1DMP 51 Waterwheel Way, Milton, VT 05468; (802) 893-6458. Location: So Burlington Middle School, Dorset Street; \$3 admission, 8 am to 3 pm. Talk-in on 145.47 or 148.85.
June 6	Queens, NY	Hall of Science ARC Hamfest/Charles Becker, WA2JUU (516) 694-3955 or Arnie Schiffman, WB2YXB (718) 343-0172. Location: NY Hall of Science parking lot, Flushing Meadow Park, 47-01 111th St. \$5 admission, free parking, opens at 9 am. Talk-in on 444.200.
June 6	Tamaqua, PA	Tamaqua Trans Society and Anthracite Repeater Assoc./Allen Breiner, Sr., W3TI 212 Race St., Tamaqua, PA 18252.
June 6	Princeton, IL	Starved Rock RC/Nils Barto, Jr., N9PLJ 2238 Schuyler Dr., Peru, IL 61354.
June 6	Butler, PA	Breezeshooters ARC/H. Rey Whanger, W3BIS Box 8, RD #2, Cove Run Rd., Cheswick, PA 15042.
June 12	Winston-Salem, NC	Winston-Salem Hamfest and Computer Fair/Forsyth ARC, B.J. Honeycutt P.O. Box 11361, Winston-Salem, NC 27116 (919) 723-7388. Location: Lawrence Joel Veterans' Coliseum Annex, 9am-5pm, \$7 admission. Talk-in on 146.04/64.
June 13	Darien, NY	Lancaster ARC Hamfest/Nick, WA2CJJ, 5645 Genesee St., Lancaster, NY 14086 (716) 681-6410; Luke, N2GDU, 1105 Ransom Rd., Lancaster, NY 14086 (716) 683-8880. Location: Darien Center Fire Co. on Route 77 at Route 20, \$5 admission, talk-in on 147.135 +.600, 146.550 Simplex, 443.850 +5.
June 13	Willow Springs, IL	6 Meter Club of Chicago/Joseph Gutwein, WA9RIJ 7109 Blackburn Ave., Downers Grove, IL 60516.
June 18-19	Albany, GA	Albany ARC/John Crosby, K4XA P.O. Box 1250, Albany, GA 31702.
June 19	Cortland, NY	Cortland Int'l Hamfest/SARC, P.O. Box 5241, Cortland, NY 13045; (607) 756-6550. Location: Cortland County Fairgrounds; \$5 admission, 7 am to 3 pm. Talk-in on 147.780/180.
July 2-4	St. Petersburg, RUSSIA	5th Annual Hamvention/St. Petersburg DX Club, Organizing Committee, P.O. Box 376, Russia, 190000, St. Petersburg.
July 10	Oak Creek, WI	South Milwaukee ARC Swapfest/P.O. Box 102, South Milwaukee, WI 53172-0102; (414) 764-3235 ext. 58. Location: American Legion Post #434, 9327 S. Shepard Ave.; 7 am to 2 pm, \$4 admission. Talk-in on 146.580 simplex.
July 10	Charleston, SC	Trident ARC/Scott Chippendale, WB3EFS, c/o TARC, P.O. Box 73, Summerville, SC 29484-0073. Location: Ladson Exchange Park on US-78, 8:30, \$5 admission. Talk-in on 147.27/87 repeater.
July 17-18	Atlanta, GA	Southeastern Division Convention/Vern Fowler, W8BLA 4343 Shalford, Suite E-6, Marietta, GA 30062.
July 18	Washington, MO	Zero Beaters ARC Hamfest/Ed Southall, WD0ELL, P.O. Box 24, Dutzow, MO 63342; (314) 459-6581 or (314) 239-0060. Location: Bernie H. Hillerman Park (Washington Fairgrounds), 6 am to 3 pm, free admission. Talk-in on 147.240 + repeater.
July 24	Manchester, NH	1993 ARRL New England Convention/New Hampshire ARC P.O. Box 573, Derry, NH 03038.
July 24-26	Anselmo, NE	Central Nebraska ARC/Eric Tinkham, KALAJ RR1 Box 155, Sargent, NE 68074.

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:

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INDEX OF ADVERTISERS

Advanced Electronics Applications	63
Aerial Dev. of New England	45
AIE Corporation	13,97
Antique Radio Classified	17
ARRL	93
ASA	45
ASC Information Systems	107
Ashton ITC	97
BBC World Service	65
Cellular Security Group	9
Chilton Pacific	3
Commtronics	53
Communications Electronics	15
Connect Systems	101
CQ Communications	65
Dallas Remote Imaging	101
Datametrics	55
Jacques d'Avignon	80
Delta Research	91
R.L. Drake Company	85
EBS Consultants	99
EEB (Electronic Equipment Bank)	19
Fort Worth Computers	103
Galaxy Electronics	13
GRE America	11
Grove Enterprises	25,39,69,77,86,87,95
Glenn Hauser	29
Ham Companion	57
ICOM America	Cover IV
Interproducts	17
Intercepts Newsletter	43
J&J Enterprises	99
Japan Radio Company	Cover III
Javiation	23
JPS Communications	11
KIWA	13,107
Klingenfuss	37
Lentini Communications	107
LJ Electronic Ind. (Transel Tech)	51
Marymac Industries	41
Microcraft Corporation	41
MilSpec Communications	9
Mobile Diagnostics	85
Monitoring Times	5,85
Motron Electronics	43,97
National Scanning Report	3
Naval Electronics	105
OptoElectronics	47, Cover II
Palomar Engineering	49,99
Pioneer Data	53
Radio Accessories	45
Radioware Corp.	23
RDI White Papers	97
Ross Engineering	49
Satman	51
Skyvision	51
Software Systems Consulting	23,105
Startek International	59
Tiare Publications	7
TRS Consultants	99
Universal Radio	55,75
V-Comm (ScanStar)	17
Viking International	41
World Com Technology	3

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LETTERS cont'd

is a lowering in resonant frequency, typically by 5% or so on wire antennas, resulting from the capacitive effects of supporting and mounting devices. It would appear from the formulas given that the TV loop has already had the compensation figured in.

"Construction and mounting certainly do play a part in end effect. An HF loop has far more support hardware than a small UHF copper-tubing loop, and the latter is mounted at a zero-voltage point where such reactances are minimal.

"Chances are you could build either antenna observing or ignoring end effect correction and notice no difference in reception."

"Don't Look, Ethel!"

In a few brief words, the Las Vegas *Review-Journal* nailed the problem with the recent anti-cellular law on the head in this quote: "Best dub this the Lady Godiva approach—don't stop her from riding naked through the streets, just make it illegal for townsfolk to ogle her!" Thanks to George Appleton for sending the clipping and for his efforts in writing his Congressfolk.

Bob Grove also composed a letter recently to the editor of *South Florida* magazine, for the "blatant hypocrisy" in their article entitled "Scan Artist."

He goes on to say, "Parroting the cellular industry's well-worn characterization of scanner listeners as 'techno creeps' who slaver over scanners, eavesdropping on people's conversations, you then devote three

full columns and much of your text to transcripts of private phone call for your readers' consumption. Do you view your readers as 'creeps' as well, or do you merely compose with a double standard?"

You tell 'em, Bob! A more realistic profile of the typical scanner listener is portrayed by "R" in a recent edition of the club publication, *Long Island Sounds*.—"Little old ladies, retired gents, children of all ages. Many retirees, some widows, widowers. They're sick of TV. Radio talk shows they find boring. They'll listen to their scanners to drift off to sleep or as company. There are many reasons: poor eyesight to read, bored by TV/radio or they find programming trashy. Scanning has the action, real life drama, the real news before it is softened by the media. They also like to tell their friends who hold up the newspaper's front page, 'Bah! I heard it as it happened, and this is what *actually* took place!'"

Several states (fourteen, according to the Thomasville *Times-Enterprise*) and city boroughs (Chicago?) are adding to the new FCC ruling to outlaw cellular listening. Georgia, for example, has made it a felony to knowingly eavesdrop on a cellular call. This, even though "such crimes as 'pointing a firearm at another' and DUI are only misdemeanors," says Bill Frantz from the "strange state of Georgia."

Welcome to the wacky world of politics and business. But enough of that; it's time to pack the scanner and head for the beach for sun, sand and super monitoring times.

Rachel Baughn,
Editor

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FCC Enacts Ban on Cellular Scanners and Converters

In our May issue we covered a number of basic questions regarding the ramifications of the new Telephone Disclosure and Dispute Resolution Act, Public Law No. 102-556, which prohibits, after April 26, 1994, the manufacture or importation of cellular-capable or cellular-restorable scanners and converters. Since then enough new questions have arisen to warrant yet one more "comment."

Q. Will it be lawful for individuals to own and resell their used cellular-capable scanners and for manufacturers to repair them after April 26, 1994?

A. Yes, indefinitely, but commercial dealers should not market used cellular-modified scanners because they violate their type acceptance.

Q. How does the FCC define a "scanner"?

A. A scanner is any radio receiver "that can automatically switch between four or more frequencies anywhere in the 30-960 MHz band." A 3-channel scanner is excluded from the new law.

Q. Are there many cellular-capable scanners on the market?

A. Between 1988 and 1993, 32 different scanners were manufactured with 800 MHz capability; of these, 22 had cellular coverage right out of the box and the remaining could have their cellular-censored frequencies restored.

The repressive law is a blow to the Clinton administration's resolve to bolster small businesses who will lose the entire American market of cellular-equipped scanners and converters to foreign exporters who remain free to sell them here.

Q. Was there any opposition to the cellular scanner ban?

A. Of 46 comments filed with the FCC, the majority, 29, were opposed to the rulemaking. Nonetheless, the Congressional mandate directed the FCC to adopt a prohibition.

Q. Will wideband 800 MHz converters still be allowed to be manufactured?

A. No. Although Congress did not ask the FCC to ban converters, and readily admits that such a ban will pose a hardship on legitimate manufacturers, the rulemaking bans any converter that can tune the cellular telephone frequencies. Since it is technically unfeasible to design an 806-960 MHz converter that

omits the cellular bands, such converters will be unlawful to manufacture.

Cable TV converters which happen to cover cellular frequencies are not banned under this rulemaking, only converters intended for scanners. No converter will have to be certified by the FCC.

Q. Can an individual lawfully build his own cellular-capable scanner or converter?

A. Yes.

Q. Can a dealer lawfully cellular-restore a scanner?

A. No; this is a violation of FCC rules and the Communications Act.

Q. Will cellular-capable scanner and converter kits be lawful?

A. Yes.

Q. Is it lawful for a user to modify his scanner to accept a personal computer to restore cellular frequencies?

A. Yes.

Q. How will the FCC make sure that a new scanner is not easily cellular-restorable?

A. The manufacturer will be required to file an explanation with the Commission upon application for certification why the cellular-censored scanner cannot be easily modified for cellular reception. This will protect the dealer from liability should the scanner be found later to be in violation.

Q. Will new scanners and converters awaiting certification before April 26, 1993, be approved?

A. No. Even though these products were filed in good faith, within the proper time frame, and met all requirements for certification under existing law, they will be rejected by the FCC.

Q. Does the new law set a dangerous precedent for other services to request protection from scanner reception?

A. The Specialized Mobile Radio Service and Personal Communications Service were denied their request to be protected under this legislation because this was not the intent of the Congressional mandate. As to whether a precedent has been set, only time will tell.





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